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SECTION 01090

SOURCES FOR REFERENCE PUBLICATIONS

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the sponsoring organization, e.g. UL 1 (1993; Rev thru Jan 1995) Flexible Metal Conduit. However, when the sponsoring organization has not assigned a number to a document, an identifying number has been assigned for convenience, e.g. UL's unnumbered 1995 edition of their Building Materials Directory is identified as UL-01 (1995) Building Materials Directory. The sponsoring organization number (UL 1) can be distinguished from an assigned identifying number (UL-01) by the lack of a dash mark (-) in the sponsoring organization assigned number.

1.2 ORDERING INFORMATION

The addresses of the organizations whose publications are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the sponsoring organization should be ordered from the source by title rather than by number.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

100 Barr Harbor Drive
West Conshohocken, PA 19428-2959
Ph: 610-832-9500
Fax: 610-832-9555
Internet: www.astm.org
NOTE: The annual ASTM Book of Standards (66 Vol) is available for $3500.00. Prices of individual standards vary.

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SECTION 01320

PROJECT SCHEDULE

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-07 Schedules

Preliminary Project Schedule; GA.
Initial Project Schedule; GA.
Periodic Schedule Updates; GA.

Two copies of the schedules showing codes, values, categories, numbers, items, etc., as required.

SD-08 Statements

Qualifications; GA.

Documentation showing qualifications of personnel preparing schedule reports.

SD-09 Reports

Narrative Report; FIO.
Schedule Reports; FIO.

Two copies of the reports showing numbers, descriptions, dates, float, starts, finishes, durations, sequences, etc., as required.

1.2 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports. This person shall have previously created and reviewed computerized schedules. Qualifications of this individual shall be submitted to the Contracting Officer for review with the Preliminary Project Schedule submission

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS, a Project Schedule as described below shall be prepared. The scheduling of construction shall be the responsibility of the Contractor. Contractor

management personnel shall actively participate in its development. Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

3.2 BASIS FOR PAYMENT

The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule or scheduling personnel shall result in an inability of the Contracting Officer to evaluate Contractor progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer and those revisions have not been included in the Project Schedule, then the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer.

3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in either the Precedence Diagram Method (PDM) or the Arrow Diagram Method (ADM).

3.3.2 Level of Detail Required

With the exception of the preliminary schedule submission, the Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the Contracting Officer at the appropriate level of detail, as specified by the Contracting Officer, shall result in the disapproval of the schedule. The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule.

3.3.2.1 Activity Durations

Contractor submissions shall follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods (usually less than 2 percent of all non-procurement activities' Original Durations shall be greater than 20 days).

3.3.2.2 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing.

3.3.2.3 Government Activities

Government and other agency activities that could impact progress shall be shown. These activities include, but are not limited to: approvals, inspections, utility tie-in, Government Furnished Equipment (GFE) and notice to proceed for phasing requirements.

3.3.2.4 Bid Item

All activities shall be identified in the project schedule by the Bid Item to which the activity belongs. An activity shall not contain work in more than one bid item. The bid item for each appropriate activity shall be identified by the Bid Item Code.

3.3.2.5 Feature of Work

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.

3.3.3 Scheduled Project Completion

The schedule interval shall extend from notice-to-proceed to the contract completion date.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date that the Notice to Proceed (NTP) was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have: a "ES" constraint, a constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.3.2 Constraint of Last Activity

Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have: a "LF" constraint, a constraint date equal to the completion date for the project, and a zero day duration.

3.3.3.3 Early Project Completion

In the event the project schedule shows completion of the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted at every

project schedule update period to assist the Contracting Officer in evaluating the Contractor's ability to actually complete prior to the contract period.

3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in-progress or completed activity and ensure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes.

3.3.6 Out-of-Sequence Progress

Activities that have posted progress without predecessors being completed (Out-of-Sequence Progress) will be allowed only on a case-by-case approval of the Contracting Officer. The Contracting Officer may direct that changes in schedule logic be made to correct any or all out-of-sequence work.

3.3.7 Extended Non-Work Periods

Designation of Holidays to account for non-work periods of over 5 days will not be allowed. Non-work periods of over 5 days shall be identified by addition of activities that represent the delays. Modifications to the logic of the project schedule shall be made to link those activities that may have been impacted by the delays to the newly added delay activities.

3.3.8 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Preliminary Project Schedule Submission

The Preliminary Project Schedule, defining the Contractor's planned operations for the first 90 calendar days shall be submitted for approval within 20 calendar days after Notice to Proceed is acknowledged. The approved preliminary schedule shall be used for payment purposes not to exceed 90 calendar days after Notice to Proceed.

3.4.2 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within 60 calendar days after Notice to Proceed. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail.

3.4.3 Periodic Schedule Updates

Based on the result of progress meetings, specified in "Periodic Progress Meetings," the Contractor shall submit periodic schedule updates. These submissions shall enable the Contracting Officer or to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgement of the Contracting Officer or authorized representative, is necessary for verifying the contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted by the Contractor for the initial submission, and every periodic project schedule update throughout the life of the project:

3.5.1 Data Disks

One data disk or one set of data disks containing the project schedule shall be provided. Data on the disks shall be in the P3 format or other format which conforms to the format specified in the attached Standard Data Exchange Format specification (attached at the end of this Project Schedule specification.

3.5.1.1 File Medium

Required data shall be submitted on 3.5-inch disks, formatted to hold 1.44 MB of data, under the MS-Windows operating system.

3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number or person responsible for the schedule, and the operating system and version used to format the disk.

3.5.1.3 File Name

Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will ensure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.2 Narrative Report

A Narrative Report shall be provided with each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the critical path(s), a description of current and anticipated problem areas or delaying factors and their impact,

and an explanation of corrective actions taken.

3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the Contracting Officer shall be included in the schedule submission. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in progress or completed.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number or "I-NODE" AND "J-NODE" and then sorted according to Early Start Date. For completed activities the Actual Start Date shall be used as the secondary sort.

3.5.4.2 Logic Report

A list of Preceding and Succeeding activities for every activity in ascending order by activity number and then sorted according to Early Start Date. For completed activities the Actual Start Date shall be used as the secondary sort.

3.5.4.3 Total Float Report

A list of all activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates.

3.5.4.4 Earnings Report

A compilation of the Contractor's Total Earnings on the project from the Notice to Proceed until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and Contracting Officer at the most recent Monthly Progress Meeting. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by bid item and sorted by activity numbers. This report shall: sum all activities in a bid item and provide a bid item percent; and complete and sum all bid items to provide a total project percent complete. The printed report shall contain, for each activity: Activity Number or "i-node" and "j-node", Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), Earnings to Date.

3.5.5 Network Diagram

The network diagram shall be required on the initial schedule submission and on monthly schedule update submissions. The network diagram shall depict and display the order and interdependence of activities and the

sequence in which the work is to be accomplished. The activity or event number, description, duration, and estimated earned value shall be shown on the diagram. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left.

3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

The critical path shall be clearly shown.

3.5.5.4 Banding

Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly onsite meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer will approve activity progress, proposed revisions, and adjustments as appropriate.

3.6.1 Meeting Attendance

The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost-to-Date shall be subject to the approval of the Contracting Officer. The following is a minimum set of items which the Contractor shall address, on an activity by activity basis, during each progress meeting.

3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish dates for each activity currently in-progress or completed activities.

3.6.3.2 Time Completion

The estimated Remaining Duration for each activity in-progress. Time-based progress calculations must be based on Remaining Duration for each activity.

3.6.3.3 Cost Completion

The earnings for each activity started. Payment will be based on earnings for each in-progress or completed activity. Payment for individual activities will not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

3.6.3.4 Logic Changes

All logic changes pertaining to Notice to Proceed on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.3.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather. 2) delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary, and 3) a schedule which does not represent the actual prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, he shall furnish such justification, project schedule data and supporting evidence as the Contracting Officer may deem necessary for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

3.7.1 Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, will not be a cause for a time extension to the contract completion date.

3.7.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date of under 2 weeks based upon the most recent schedule update at the time of the Notice to Proceed or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

a. A list of affected activities, with their associated project schedule activity number.

b. A brief explanation of the causes of the change.

c. An analysis of the overall impact of the changes proposed.

d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

For any requested time extension of over 2 weeks, the Contracting Officer may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If Notice to Proceed (NTP) is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The proposed revisions to the schedule will be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, the Contractor shall advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

-- End of Section --

STANDARD DATA EXCHANGE FORMAT SPECIFICATION

PART 1- GENERAL

1. Application of This Provision: The Standard Data Exchange Format (SDEF) provides a non-proprietary protocol to exchange project planning and progress data between scheduling systems.

2. File Type and Format: The data file shall consist of a 132 character, freed format, "ASCII" file. Text shall be left-justified and numbers shall be right-justified in each field. Data records must conform, exactly, to the sequence, column position, maximum length, mandatory values, and field definitions described below to comply with the SDEF. Unless specifically stated, all numbers shall be whole numbers. Fields containing numbers shall not be zero filled. All data columns shall be separated by a single blank column. The file shall not contain blank lines.

3. Usage Notes: Where appropriate, notes regarding proper usage of systems to support the SDEF have been included in brackets ([ ]). These notes are included to assist users in creating SDEF-compatible files, given the variety of software systems that support the SDEF.

4. Recommended Systems: Several systems have been tested to determine the accuracy of importing and exporting SDEF files. For information on the current list of recommended systems, please contact Mr. Stan Green at HQUSACE, (202) 761-0206. Although the currently listed system have been tested other systems may also be acceptable provided those systems correctly import and export SDEF files.

5. SDEF Checker Program: A program that checks whether a file meets the SDEF is available free of charge. A copy of this program may be obtained by written request to: U.S. Army Corps of Engineers, ATTN: Mr. Bill East (CECER-FFA), P.O. Box 9005, Champaign, IL 61826-90005. A description of the SDEF Checker is also available on the Internet and CivilNet.

PART 2- SDEF SPECIFICATION

6. SDEF Organization: The SDEF shall consist of the following records provided in the exact sequence shown below:

Paragraph Reference	Record Description	Remarks
6.a	Volume Record	Mandatory First Line of File
6.b	Project Record	Mandatory Second Line of File
6.c	Calendar Record(s)	Mandatory One Record Minimum
6.d	Holiday Record(s)	Mandatory if Holidays Used
6.e	Activity Record(s)	Mandatory Records
6.f	Precedence Record(s)	Mandatory for Precedence
6.g	Unit Cost Record(s)	Mandatory for Unit Costs
6.h	Progress Record(s)	Mandatory Records
6.i	File End Record	Mandatory Last Line of Disk/File

6.a. Volume Record: The Volume Record shall be used to control the transfer of data that may not fit on a single disk. The first line in every file used to store SDEF data shall be the Volume Record. The Volume Record shall sequentially identify the number of the data transfer disk(s). The Volume Record shall have the following format:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1 - 4	4	VOLM	Fixed	Filled
DISK NUMBER	6 - 7	2	√	Number	Right Justified

6.a.(l) The RECORD IDENTIFIER is the first four characters of this record. The required value for this field shall be "VOLM". The VOLM record must appear on the first line of the SDEF data file.

6.a.(2) The DISK NUMBER field shall identify the number of the data disk used to store the data exchange information. If all data may be contained on a single disk, this field shall contain the value of "l". If more disks are required, then the second disk shall contain the value "2", the third disk shall be designated with a "3", and so on. Identifcation of the last data disk is accomplished in the Reject End Record.

6.b. Project Record: The Project Identifier Record shall contain general project information. Because more than one SDEF file may be required for data transfer between large projects, the PROJ record shall be the second line of the first SDEF file transferred. The PROJ record shall contain information in the following format:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1- 4	4	PROJ	Fixed	Filled
DATA DATE	6- 12	7	√	ddmmmyy	Filled
PROJECT IDENTIFIER	14-17	4	√	Alpha.	Left Justified
PROJECT NAME	19-66	48	√	Alpha.	Left Justified
CONTRACTOR NAME	68-103	36	√	Alpha.	Left Justified
ARROW OR PRECEDENCE	105-105	1	A,P	Fixed	Filled
CONTRACT NUMBER	107-112	6	√	Alpha.	Left Justified
PROJECT START	114-120	7	√	ddmmmyy	Filled
PROJECT END	122-128	7	√	ddmmmyy	Filled

6.b.(1) The RECORD IDENTIFIER is the first four characters of this record. The required value for this field shall be "PROJ". This record shall contain the general project information and indicates which scheduling method shall be used.

6.b.(2) The DATA DATE is the date of the schedule calculation. The abbreviation "ddmmmyy" refers to a date format that shall translate a date into two numbers for the day, three letters for the month, and two numbers for the year. For example, March 1, 1999 shall be translated into 01Mar99. This same convention for date formats shall be used throughout the entire data format. To ensure that dates are translated consistently, the following abbreviations shall be used for the three character month code:

Abbreviation	Month
JAN	January
FEB	February
MAR	March
APR	April
MAY	May
JUN	June
JUL	July
AUG	August
SEP	September
OCT	October
NOV	November
DEC	December

6.b.(3) The PROJECT IDENTIFIER is a maximum four character abbreviation for the schedule. These four characters shall be used to uniquely identify the project and specific update as agreed upon by Contractor and Contracting Officer. When utilizing scheduling software these four characters shall be used to select the project. Software manufacturers shall provide information to users to ensure that data importing programs do not automatically overwrite other schedules with the same PROJECT IDENTIFIER.

6.b.(4) The PROJECT NAME field shall contain the name and location of the project edited to fit the space provided. The data appearing here shall appear on scheduling software reports. The abbreviation "Alpha." refers to an "Alphanumeric" field value and shall be used throughout the remainder of this specification.

6.b.(5) The CONTRACTOR NAME field shall contain the Construction Contractor's name, edited to fit the space provided.

6.b.(6) The ARROW OR PRECEDENCE field shall indicate which method shall be used for calculation of the schedule. The value "A" shall signify the Arrow Diagramming Method. The value "P" shall signify the Precedence Diagramming Method. The ACTIVITY ID field of the Activity Record shall be interpreted differently depending on the value of this field. The Precedence Record shall be required if the value of this field is "P". [Usage note: software systems may not support both arrow and precedence diagramming. It is recommended that the selection of the type of network be based on the capabilities of the software used by project partners.]

6.b.(7) The CONTRACT NUMBER field shall contain the contract number for the project. For example, the construction contract number DACA85-89-C-0001 shall be entered into this field as "890001".

6.b.(8) The PROJECT START field shall contain the date that the Contractor acknowledges the Notice to Proceed (NTP). [Usage note: Software systems may use a project start date to constrain the first activity of a network. To ensure consistent scheduling calculations across products, it is recommended that the first activity in the schedule contain an EARLY START constraint and a software system's PROJECT START date only be used to report on the project's start date.]

6.b.(9) The PROJECT END field shall contain the date that the Contractor plans to complete the work as approved by the Contracting Officer. [Usage note: software systems may use a project end date to constrain the last activity of a network. To ensure consistent scheduling calculations across products, it is recommended that the last activity in the schedule contain an EARLY START constraint and a software system's PROJECT END date only be used to report on the project's end date.]

6.c. Calendar Record: The Calendar Record(s) shall follow the Project Identifier Record in the first disk of data transferred. A minimum of one Calendar Record shall be required for all data exchange activity files. The format for the Calendar Record shall be as follows:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1 - 4	4	CLDR	Fixed	Filled
CALENDAR CODE	6 - 6	1	√	Alpha.	Filled
WORKDAYS	8 - 14	7	SMTWTFS	Fixed	Filled
CALENDAR DESCRIPTION	16-45	30	√	Alpha.	Left Justified

6.c.(1) The RECORD IDENTIFIER shall always begin with "CLDR" to identify it as a Calendar Record. Each Calendar Record used shall have this identification in the first four columns. [Usage note: Systems contain a variety of calendar options. It is recommended that the least common denominator of calendar features between the systems be used as the basis for creating the SDEF file for a given project.]

6.c.(2) The CALENDAR CODE shall be used in the activity records to signify that this calendar is associated with the activity. [Usage note: Some systems do not allow for alphanumeric CALENDAR CODES, but only allow positive integers from 1 to 9. It is recommended that only positive integers be used for the CALENDAR CODE field to support the widest variety of scheduling systems.]

6.c.(3) The WORKDAYS field shall contain the work-week pattern selected with "Y", for Yes, and "N", for No. The first character shall be Sunday and the last character Saturday. An example of a typical five (5) day work-week would be NYYYYYN. A seven (7) day work-week would be YYYYYYY.

6.c.(4) The CALENDAR DESCRIPTION shall be used to briefly describe the calendar used.

6.d. Holiday Record: The Holiday Record(s) shall follow the Calendar Record(s) in the first disk of data transferred. There may be calendars without any holidays designated or several Holiday Records for each Calendar Record(s). The format for the Holiday Record shall be as follows:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1-4	4	HOLI	Fixed	Filled
CALENDAR CODE	6-6	1	√	Alpha.	Filled
HOLIDAY DATE	8-14	7	√	ddmmmyy	Filled
HOLIDAY DATE	16-22	7	-	ddmmmyy	May be Filled
HOLIDAY DATE	24-30	7	-	ddmmmyy	May be Filled
HOLIDAY DATE	32-38	7	-	ddmmmyy	May be Filled
HOLIDAY DATE	40-46	7	-	ddmmmyy	May be Filled
HOLIDAY DATE	48-54	7	-	ddmmmyy	May be Filled
HOLIDAY DATE	56-62	7	-	ddmmmyy	May be Filled
HOLIDAY DATE	64-70	7	-	ddmmmyy	May be Filled
HOLIDAY DATE	72-78	7	-	ddmmmyy	May be Filled
HOLIDAY DATE	80-86	7	-	ddmmmyy	May be Filled
HOLIDAY DATE	88-94	7	-	ddmmmyy	May be Filled
HOLIDAY DATE	96-102	7	-	ddmmmyy	May be Filled
HOLIDAY DATE	104-110	7	-	ddmmmyy	May be Filled
HOLIDAY DATE	112-118	7	-	ddmmmyy	May be Filled
HOLIDAY DATE	120-126	7	-	ddmmmyy	May be Filled

6.d.(1) The RECORD IDENTIFIER shall always begin with "HOLI". Each Holiday Record used shall have this identification in the first four columns.

6.d.(2) The CALENDAR CODE indicates which work-week calendar the holidays shall be applied to. More than one HOLI record may be used for a given CALENDAR CODE.

6.d.(3) The HOLIDAY DATE shall contain the date of each individual non-work day.

6.e. Activity Records: Activity Records shall follow any Holiday Record(s). If there are no Holiday Record(s), then the Activity Records shall follow the Calendar Record(s). There shall be one Activity Record for every activity in the network. Each activity shall have one record in the following format:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1-4	4	ACTV	Fixed	Filled
ACTIVITY ID	6-15	10	√	Integer	See Comment Below
ACTIVITY DESCR.	17-46	30	√	Alpha.	Left Justified
ACTIVITY DURATION	48-50	3	√	Integer	Right Justified
CONSTRAINT DATE	52-58	7		ddmmmyy	May be Filled
CONSTRAINT TYPE	60-61	2		ES or LF	May be Filled
CALENDAR CODE	63-63	1	√	Alpha.	Filled
HAMMOCK CODE	65-65	1	Y, blank	Fixed	May be Filled
WORKERS PER DAY	67-69	3		Integer	Right Justified
RESPONSIBILITY CODE	71-74	4		Alpha.	Left Justified
WORK AREA CODE	76-79	4		Alpha.	Left Justified
MOD OR CLAIM NO.	81-86	6		Alpha.	Left Justified
BID ITEM	88-93	6		Alpha.	Left Justified
PHASE OF WORK	95-96	2		Alpha.	Left Justified
CATEGORY OF WORK	98-98	1		Alpha.	May be Filled
FEATURE OF WORK	100-128	30		Alpha.	Left Justified

6.e.(1) The RECORD IDENTIFIER for each activity description record must begin with the four character "ACTV" code. This field shall be used for both the Arrow Diagram Method (ADM) and Precedence Diagram Method (PDM).

6.e.(2) The ACTIVITY ID consists of coding that shall differ, depending on whether the ADM or PDM method was selected in the Project Record. If the ADM method was selected then the field shall be interpreted as two right-justified fields of five (5) integers each. If the PDM method was selected the field shall be interpreted as one (1) right-justified field of ten (10) integers each. The maximum activity number allowed under this arrangement is 99999 for ADM and 9999999999 for the PDM method. [Usage note: Many systems allow alphanumeric ACTIVITY IDs. While the SDEF does not strictly, allow the use of alphanumeric values, users may agree to use the ACTIVITY ID field to exchange alphanumeric data. It is recommended that the ACTIVITY ID be restricted to integers when one or more of the systems being used for scheduling allows only integer ACTIVITY ID values.]

6.e.(3) The ACTIVITY DESCRIPTION shall be a maximum of 30 characters. Descriptions must be limited to the space provided.

6.e.(4) The ACTIVITY DURATION contains the estimated original duration for the activity on the schedule. The duration shall be based upon the work-week designated by the activity's related calendar.

6.e.(5) The CONSTRAINT DATE field shall be used to identify a date that the scheduling system may use to modify float calculations. If there is a date in this field, then there must be a valid entry in the CONSTRAINT TYPE field.

6.e.(6) The CONSTRAINT TYPE field shall be used to identify the way that the scheduling system shall use the CONSTRAINT DATE to modify schedule float calculations. If there is a value in this field, then there must be a valid entry in the CONSTRAINT DATE field. The valid values for the CONSTRAINT TYPE are as follows:

Code	Definition
ES	The CONSTRAINT DATE shall replace an activity's early start date, if the early start date is prior to the CONSTRAINT DATE.
LF	The CONSTRAINT DATE shall replace an activity's late finish date, if the late finish date is after the CONSTRAINT DATE.

[Usage note: Systems provide a wide variety of constraint types that may not be supported by other systems. It is recommended that constraint types be restricted to the values above regardless of the capabilities of the various systems being used for scheduling.]

6.e.(7) The CALENDAR CODE relates this activity to an appropriate work-week calendar. The ACTIVITY DURATION must be based on the valid work-week referenced by this CALENDAR CODE field.

6.e.(8) The HAMMOCK CODE indicates that a particular activity does not have its own independent duration, but takes its start dates from the start date of the preceding activity (or node) and takes its finish dates from the finish dates of its succeeding activity (or node). If the value of the HAMMOCK CODE field is "Y", then the activity is a hammmock activity.

6.e.(9) The WORKERS PER DAY shall contain the average number of workers expected to work on the activity each day the activity is in progress. If this code is required by project scheduling specifications, values for this data will be right justified. Activities without workers per day shall have a value of "0".

6.e.(10) The RESPONSIBILITY CODE shall identify the subcontractors or major trade involved with completing the work for the activity. If this code is required by project scheduling specifications, value for this data will be left justified.

6.e.(11) The WORK AREA CODE shall identify the location of the activity within the project. If this code is required by project scheduling specifications, value for this data will be left justified.

6.e.(12) The MOD OR CLAIM NUMBER shall uniquely identify activities that are added or changed on a construction contract modification, or activities that justify any claimed time extensions. If this code is required by project scheduling specifications, value for this data will be left justified.

6.e.(13) The BID ITEM shall identify the bid item number associated with each activity. If this code is required by project scheduling specifications, value for this data will be left justified.

6.e.(14) The PHASE OF WORK shall identify the timing of a specific activity within the entire project. If this code is required by project scheduling specifications, value for this data will be left justified.

6.e.(15) The CATEGORY OF WORK shall identify the general type of work performed by every activity. If this code is required by project scheduling specifications, value for this data will be placed in the field.

6.e.(16) The FEATURE OF WORK shall identify a very broad designation of the general type of work that is being accomplished by the activity. If this code is required by project scheduling specifications, value for this data will be left justified. [Usage note: Many systems require that FEATURE OF WORK values be placed in several activity code fields. It is recommended that users review SDEF documentation to determine the correct way to use a given software system to produce the FEATURE OF WORK code.]

6.f. Precedence Record: The Precedence Record(s) shall follow the Activity Records if a Precedence Diagram Method schedule (PDM) is identified in the ARROW OR PRECEDENCE field of the Project Record. The Precedence Record has the following format:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1 - 4	4	PRED	Fixed	Filled
ACTIVITY ID	6-15	10	√	Integer	See Comment Below
PRECEDING ACTIVITY	17 -26	10	√	Integer	See Comment Below
PREDECESSOR TYPE	28-28	1	√	S, F, C	Filled
LAG DURATION	30-33	4	√	Integer	Right Justified

6.f.(1) The RECORD IDENTIFIER shall begin with the four characters "PRED" in the first four columns of the record.

6.f.(2) The ACTIVITY ID identifies the activity whose predecessor shall be specified in this record.

6.f.(3) The PRECEDING ACTIVITY number is the number of an activity that precedes the activity noted in the ACTIVITY ID field.

6.f.(4) The PREDECESSOR TYPE field indicates the type of relation that exists between the chosen pair of activities. Valid PREDECESSOR TYPE fields areas follows:

Code	Definition
S	Start-to-Start relation
F	Finish-to-Finish relation
C	Finish-to-Start relation

[Usage note: Some systems provide additional predecessor types that may not be supported by all other systems. It is recommended that predecessor types be restricted to the values above regardless of the capabilities of the various systems being used for scheduling.]

6.f.(5) The LAG DURATION field contains the number of days delay between the preceding and current activity. [Usage note: Some systems allow negative values for the LAG DURATION. Because these values are not supported by all other systems, it is recommended that values be restricted to zero and positive integers.]

6.g. Unit Cost Record: The Unit Cost Record shall follow all Precedence Records. If the schedule utilizes the Arrow Diagram Method, then the Unit Cost Record shall follow any Activity records. There shall be one Unit Cost Record for every activity that is not a lump sum activity. [Usage note: (1) It is recommended that users who wish to exchange unit cost data contact SDEF vendor representatives to determine the ability of the software system to import/export unit cost information. (2) If the software being used by each member of the project team supports unit cost data then users may wish to conduct a trial run of the SDEF data exchange with a two or three-activity network to ensure that unit cost data transfers as expected. If problems are found please consult vendor representatives for resolution prior to exchange of full project schedules. (3) Unit cost record data does not, in most systems, result in the correct values being placed in the ACTIVITY COST and COST TO DATE fields of the Progress (PROG) Record. Users must, at this time, manually transfer the data from the Unit Cost Record to the Progress Record.]

The fields for this record shall take the following format:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1-4	4	UNIT	Fixed	Filled
ACTIVITY ID	6-15	10	√	Integer	See Comment Below
TOTAL QTY	17-29	13	√	Format 8.4	Right Justified
COST PER UNIT	31-43	13	√	Format 8.4	Right Justified
QTY TO DATE	45-57	13	√	Format 8.4	Right Justified
UNIT OF MEASURE	59-61	3	√	Alpha.	Left Justified

6.g.(1) The RECORD IDENTIFIER shall be identified with the four characters 'UNIT" placed in the first four columns of the record.

6.g.(2) The ACTIVITY ID for each activity shall match the format described in the activity record. Each activity may have only one Unit Cost Record.

6.g.(3) The TOTAL QTY is the total amount of material to be used in this activity. This number consists of eight digits, one decimal point and four more digits. An example of a number in this format is "11111111.1111". If decimal places are not needed this field shall still contain a ".0000" in columns 25-29. [Usage note: Many systems support a different format for this value that does not include as many decimal places. It is recommended that users determine their requirements for significant digits based on the lowest common denominator of the software systems being used for a given project.]

6.g.(4) The COST PER UNIT is the cost, in dollars and cents, for each unit to be used in this activity. This number consists of eight digits, one decimal point, and four more digits. An example of a number in this format is "11111111.1111". If decimal places are not needed this field shall still contain a ".0000" in columns 39-43. [Usage note: Many systems support a different format for this value that does not include as many decimal places. It is recommended that users determine their requirements for significant digits based on the lowest common denominator of the software systems being used for a given project.]

6.g.(5) The QTY TO DATE is the quantity of material installed in this activity up to the data date. This number consists of eight digits, one decimal point, and four more digits. An example of a number in this format is "11111111.1111". If decimal places are not needed this field shall still contain a ".0000" in columns 53-57. [Usage note: Many systems support a different format for this value that does not include as many decimal places. It is recommended that users determine their requirements for significant digits based on the lowest common denominator of the software systems being used for a given project.]

6.g.(6) The UNIT OF MEASURE is an abbreviation that may be used to describe the units being measured for this activity. Valid values for this field are any meaningful English or metric unit, except "LS" for Lump Sum. Lump Sum activities are not to have Unit Cost Records.

6.h. Progress Record: Progress Record(s) shall follow all Unit Cost Record(s). If there are no Unit Cost Record(s), then the Progress Record(s) shall follow all Precedence Records. If the schedule utilizes the Arrow Diagram Method, then the Progress Record shall follow any Activity Records. One Progress Record is required for every activity in the Activity Record. The fields for this Record shall be provided in the following format:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1-4	4	PROG	Fixed	Filled
ACTIVITY ID	6-5	10	√	Integer	See Comment Below
ACTUAL START DATE	17-23	7	√	ddmmmyy	Filled if Started
ACTUAL FINISH DATE	25-31	7	√	ddmmmyy	Filled if Finished
REMAINING DURATION	33-35	3	√	Integer	Right Justified
ACTIVITY COST	37-48	12	√	Format 9.2	Right Justified
COST TO DATE	50-61	12	√	Format 9.2	Right Justitied
STORED MATERIAL	63-74	12	√	Format 9.2	Right Justified
EARLY START DATE	76-82	7	√	ddmmmyy	Filled if Not Started
EARLY FINISH DATE	84-90	7	√	ddmmmyy	Filled if Not Finished
LATE START DATE	92-98	7	√	ddmmmyy	Filled if Not Started
LATE FINISH DATE	100-1067		√	ddmmmyy	Filled if Not Finished
FLOAT SIGN	108-1081		+,-	Fixed	Filled if Not Finished
TOTAL FLOAT	110-1123		√	Integer	R. Just. if Not Finished

6.h.(1) The RECORD IDENTIFIER shall begin with the four characters "PROG" in the first four columns of the record.

6.h.(2) The ACTIVITY ID for each activity for which progress has been posted shall match the format described in the Activity Record.

6.h.(3) An ACTUAL START DATE is required for all in-progress activities. The ACTUAL START DATE shall be the same as, or later than, the PROJECT START date contained in the Project Record. The ACTUAL START DATE shall also be the same as, or prior to, the DATA DATE contained in the Project Record. If there is an ACTUAL START DATE for an activity that there must also be a REMAINING DURATION, and the values for the EARLY START DATE and LATE START DATE are blank. [Usage note: Some systems allow default values for ACTUAL START DATE if the date is not entered by the user. Because the failure to include a start date for activities may result in different schedule calculations, it is recommended that the ACTUAL START DATE be required for all activities in progress.]

6.h.(4) An ACTUAL FINISH DATE is required for all completed activities. If the REMAINING DURATION of an activity is zero, then there must be an ACTUAL FINISH DATE. If there is an ACTUAL FINISH DATE, then values for the EARLY START DATE, LATE START DATE, EARLY FINISH DATE, LATE FINISH DATE, FLOAT SIGN, and TOTAL FLOAT shall be blank. [Usage note: Some systems allow default values for ACTUAL FINISH DATE if the date is not entered by the user. Because the failure to include a finish date for activities may result in different schedule calculations, it is recommended that the ACTUAL FINISH DATE be required for all activities in progress.]

6.h.(5)AREMAININ G DURATION is required for all activities. Activities that have not started shall have a remaining duration equal to their original duration. Activities completed based on time, shall have a zero (0) REMAINING DURATION. [Usage note: Systems have a variety of "short-cut" methods to determine the REMAINING DURATION value. It is recommended that users actually consider the time required to complete the remaining work on a given task, rather than allow a system to calculate the remaining duration based on the amount of work that has already been accomplished.]

6.h.(6) The ACTIVITY COST contains the estimated earned value of the work to be accomplished in the activity. An example of a number in this format is "1111111 11.11". If decimal places are not needed this field shall still contain a ".00" in the last three columns of this field. [Usage note: Users should inquire of software vendors if the user needs to add a zero in the data field to produce the default value "0.00".]

6.h.(7) The COST TO DATE contains the earned value for the activity. If there is an ACTUAL START DATE, then there must also be some value for COST TO DATE. An example of a number in this format is "111111111.11". If decimal places are not needed, this field shall still contain a ".00" in the last three columns of this field. The COST TO DATE is not tied to REMAINING DURATION. For example, if the REMAINING DURATION is "0", the COST TO DATE may only be 95% of the ACTIVITY COST. This difference may be used to reflect 5% retainage for punch list items. [Usage note: Systems implement cost information in different ways. It is recommended that users carefully review SDEF documentation and test results to determine how to ensure that SDEF data is exported correctly.]

6.h.(8) The STORED MATERIAL field contains the value of the material that the Contractor has paid for and is on site or in secure storage areas that is a portion of the COST TO DATE. An example of a number in this format is "111111111.11". If decimal places are not needed, this field shall still contain a ".00" in the last three columns of this field. [Usage note: Systems implement the stored materials field in a variety of ways. Many systems do not enforce STORED MATERIAL + COST TO DATE < ACTIVITY COST. To avoid potential confusion between systems, it is recommended that new activities be added to a schedule to reflect the cost of large equipment procurement rather than use the STORED MATERIALS field.]

6.h.(9) The EARLY START DATE indicates the earliest date possible that an activity can start as calculated by a CPM scheduling system or other Contracting Officer approved planning method. If the progress record for an activity contains an ACTUAL START DATE, then this field shall be blank.

6.h.(10) The EARLY FINISH DATE indicates the earliest date possible that an activity can finish as calculated by a CPM scheduling system or other Contracting Officer approved planning method. If the progress record for an activity contains an ACTUAL FINISH DATE, then this field shall be blank.

6.h.(11) The LATE START DATE indicates the latest date that an activity can begin as calculated by a CPM scheduling system or other Contracting Officer approved planning method. If the progress record for an activity contains an ACTUAL START DATE, then this field shall be blank.

6.h.(12) The LATE FINISH DATE indicates the latest date that an activity can finish as calculated by a CPM scheduling system or other Contracting Officer approved planning method. If the progress record for an activity contains an ACTUAL FINISH DATE, then this field shall be blank.

6.h.(13) The FLOAT SIGN indicates whether the float time calculated using a CPM scheduling system or other Contracting Officer approved planning method, is positive or negative in nature. If the progress record for an activity contains an ACTUAL FINISH DATE, then this field shall be blank. In the case of zero float this field shall be blank.

6.h.(14) The TOTAL FLOAT indicates the total float time. In the Precedence Diagram Method (PDM), the total float is the difference between the early and late start or finish dates. In the Arrow Diagram Method (ADM), the total float is equal to the late event time at the end of the activity, minus the sum of the early event time at the start of the activity plus the duration of the activity.

6.i. Project End Record: The Project End Record shall be used to identify that the data file is completed. If the ASCII End of File character is encountered, then data import programs shall use that character to infer that the data continues on the next disk. The user shall then be prompted for the next disk number, based on the VOLM record data. The Project End Record shall be the last record of the entire data file, and shall have the following format:

Description	Column Position	Max. Len.	Req. Value	Type	Notes
RECORD IDENTIFIER	1-3	3	END	Fixed	Filled

6.i.(1) The RECORD IDENTIFIER for the Project End Record shall be "END". Data contained in the data exchange file that occurs after this record shall not be used.

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SECTION 01330

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SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUBMITTAL IDENTIFICATION

Submittals required are identified by SD numbers as follows:

SD-01 Data

SD-04 Drawings

SD-06 Instructions

SD-07 Schedules

SD-08 Statements

SD-09 Reports

SD-13 Certificates

SD-14 Samples

SD-18 Records

SD-19 Operation and Maintenance Manuals

1.2 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.2.1 Government Approved

Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.2.2 Information Only

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.3 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the CQC requirements of this

contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.4 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Contracting Officer.

1.5 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) representative and each item shall be stamped, signed, and dated by the CQC representative indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

3.2 SUBMITTAL REGISTER (ENG FORM 4288)

At the end of this section is one set of ENG Form 4288 listing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. The Contractor will also be given the submittal register as a diskette containing the computerized ENG Form 4288 and instructions on the use of the diskette. Columns "d" through "r" have been completed by the Government; the Contractor shall complete columns "a" and "s" through "u" and submit the forms (hard copy plus associated electronic file) to the Contracting Officer for approval within 30 calendar

days after Notice to Proceed. The Contractor shall keep this diskette up-to-date and shall submit it to the Government together with the monthly payment request. The approved submittal register will become the scheduling document and will be used to control submittals throughout the life of the contract. The submittal register and the progress schedules shall be coordinated.

3.3 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 30 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals. An additional 15 calendar days shall be allowed and shown on the register for review and approval of submittals for food service equipment and refrigeration and HVAC control systems.

3.4 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

3.5 SUBMITTAL PROCEDURE

Submittals shall be made as follows:

3.5.1 Procedures

Submittals to the Contracting Officer are required in the number of copies identified in paragraphs 3.7 and 3.8 and shall be submitted to:

U.S. Army Corps of Engineer District, Honolulu
Fort Shafter Resident Office, Bldg 230
Fort Shafter, Hawaii 96858-5440

3.5.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

3.6 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

3.7 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. 3 copies of the submittal will be retained by the Contracting Officer and 1 copy of the submittal will be returned to the Contractor.

3.8 INFORMATION ONLY SUBMITTALS

Submittals provided For Information Only (FIO) to the Government shall be submitted in three (3) copies, including resubmittals. Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

3.9 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR
(Firm Name)
_____ Approved
_____ Approved with corrections as noted on submittal data and/or attached sheets(s).
SIGNATURE: _____
TITLE: _____
DATE: _____

-- End of Section --

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION
LAUNIUPOKI SHORE PROJECT, MAUI

CONTRACTOR

SPECIFICATION SECTION
01320

ACTIVITY NO	TRANS-MITTAL NO.	ITEM NO	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL									CLASSI-FICATION		REVIEWER	CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION		GOVERNMENT ACTION			
					DATA	INSPECTION	STANDARD	CERTIFICATE	O&M	INFORMATION ONLY	GOVT APPROVED						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERN-MENT	CODE	DATE	REMARKS
a.	b.	c.	d.	e.	i.	g.	j.	k.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.	z.	aa.				
			1.1	Preliminary Project Schedule																					
			1.1	Initial Project Schedule																					
			1.1	Periodic Schedule Updates																					
			1.1	Qualifications			X																		
			1.1	Narrative Report				X																	
			1.1	Schedule Reports				X																	

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION

LAUNIUPOKI SHORE PROJECT, MAUI

CONTRACTOR

SPECIFICATION SECTION

01430

ACTIVITY NO	TRANSMITTAL NO.	ITEM NO	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL									CLASSIFICATION		REVIEWER	CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION		GOVERNMENT ACTION			
					DATA	INSPECTION	STANDARDS	CERTIFICATES	O&M	INFORMATION ONLY	GOVT APPROVED						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERNMENT	CODE	DATE	REMARKS
a.	b.	c.	d.	e.	i.	j.	k.	l.	m.	n.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.	z.	aa.		
			1.3	Environmental Protection Plan																					

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION

LAUNIUPOKI SHORE PROJECT, MAUI

CONTRACTOR

SPECIFICATION SECTION

01780

ACTIVITY NO a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	INSTRUCTIONS g.	SCHEDULES h.	LITERATURE i.	SAMPLES j.	CERTIFICATES k.	SPECIAL l.	BOND m.	O&M n.	CLASSIFICATION: INFORMATION ONLY o.	GOVT APPROVED p.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CONTRACTOR ACTION: CODE v.	DATE w.	GOVERNMENT ACTION: SUBMIT TO GOVERN-MENT x.	CODE y.	DATE z.	REMARKS aa.
			1.1	As-Built Drawings								X		X											
			1.1	As-Built Record of Equipment and Materials																					
			1.1	Warranty Management Plan										X											
			1.1	Warranty Tags								X		X											
			1.1	Final Clean-Up								X		X											

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION

LAUNIUPOKI SHORE PROJECT, MAUI

CONTRACTOR

SPECIFICATION SECTION

01900

ACTIVITY NO a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	INSTALLATION INSTRUCTIONS g.	SCHEDULE h.	SAMPLE i.	TEST METHODS j.	FIELD CERTIFICATES k.	SAMPLE m.	BOND n.	O & M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CONTRACTOR ACTION: CODE v.	DATE w.	SUBMIT TO GOVERN-MENT x.	GOVERNMENT ACTION: CODE y.	DATE z.	REMARKS aa.
			1.1	Equipment Data	X									X											
			1.1	As-Built Drawings										X											
			1.1	Progress Chart				X							X										
			1.1	Inspection of Existing Conditions																					
			1.1	Products Containing Recovered Materials																					
			1.1	Dust Control								X			X										
			1.1	Excavation/Trenching Clearance																					
			1.1	Condition of Contractor's Operation or Storage Area																					

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION

LAUNIUPOKI SHORE PROJECT, MAUI

CONTRACTOR

SPECIFICATION SECTION

02210

ACTIVITY NO a.	TRANSMITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	INSPECTION CHECKLISTS g.	INSPECTION CHECKLISTS h.	STATEMENT OF CONFORMANCE i.	STATEMENT OF CONFORMANCE j.	CERTIFICATES OF COMPLIANCE k.	SAMPLES l.	SAMPLES m.	RECORD DRAWINGS n.	O & M MANUALS o.	CLASSIFICATION: INFORMATION ONLY p.	CLASSIFICATION: GOVERNMENT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	CONTRACTOR SCHEDULE DATES: APPROVAL NEEDED BY t.	CONTRACTOR SCHEDULE DATES: MATERIAL NEEDED BY u.	CONTRACTOR ACTION: CODE v.	CONTRACTOR ACTION: DATE w.	SUBMIT TO GOVERNMENT x.	GOVERNMENT ACTION: CODE y.	GOVERNMENT ACTION: DATE z.	REMARKS aa.
			1.3	Field Testing Control											X											
			1.3	Field Testing Control											X											
			1.3	Satisfactory Materials											X											

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION

LAUNIUPOKI SHORE PROJECT, MAUI

CONTRACTOR

SPECIFICATION SECTION

02378

ACTIVITY NO a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DATA f.	INSPECTION CHECKLIST g.	SCHEDULE h.	STATEMENT i.	FEDERAL SPECIFICATIONS j.	CERTIFICATE OF COMPLIANCE k.	SAMPLE l.	FOR BIDDING PURPOSES m.	O & M MANUALS n.	INFORMATION ONLY o.	CLASSIFICATION: GOVERNMENT APPROVED p.	REVIEWER q.	CONTRACTOR SCHEDULE DATES: SUBMIT r.	APPROVAL NEEDED BY s.	MATERIAL NEEDED BY t.	CONTRACTOR ACTION: CODE u.	DATE v.	SUBMIT TO GOVERN-MENT w.	GOVERNMENT ACTION: CODE x.	DATE y.	REMARKS z.
			2.1.1.1	Geotextile						X				X											
			2.1.1.1	Geotextile							X			X											

SUBMITTAL REGISTER
(ER 415 1-10)

CONTRACT NO.

TITLE AND LOCATION

LAUNIUPOKI SHORE PROJECT, MAUI

CONTRACTOR

SPECIFICATION SECTION

04413

ACTIVITY NO a.	TRANSMITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	TYPE OF SUBMITTAL: DAR f.	DFAN g.	INSTR CONST h.	SCHED BID ITEMS i.	STAT BID ITEMS j.	FEB CERT k.	CERT FOR CONST l.	SAMP FOR APPR m.	BRO FOR APPR n.	O&M MANUALS o.	CLASSIFICATION: INFORMA CNLY p.	GOVT APPROVED q.	REVIEWER r.	CONTRACTOR SCHEDULE DATES: SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CONTRACTOR ACTION: CODE v.	DATE w.	GOVERNMENT ACTION: SUBMIT TO GOVERN-MENT x.	CODE y.	DATE z.	REMARKS aa.
			1.2	Selection of borrow sources and																						
				detailed plans for quarry operations																						
			1.2	Stone								X				X										

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE *(Read instructions on the reverse side prior to initiating this form)*	DATE	TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:	FROM:	CONTRACT NO.	CHECK ONE: ☐ THIS IS A NEW TRANSMITTAL ☐ THIS IS A RESUBMITTAL OF TRANSMITTAL _____
SPECIFICATION SEC. NO. *(Cover only one section with each transmittal)*	PROJECT TITLE AND LOCATION		CHECK ONE: THIS TRANSMITTAL IS FOR ☐ FIO ☐ GOV'T. APPROVAL

ITEM NO. *a.*	DESCRIPTION OF ITEM SUBMITTED *(Type size, model number/etc.)* *b.*	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. *(See Instruction no. 8)* *c.*	NO. OF COPIES *d.*	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE *g.*	VARIATION *(See Instruction No. 6)* *h.*	FOR CE USE CODE *i.*
				SPEC. PARA. NO. *e.*	DRAWING SHEET NO. *f.*			

REMARKS

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated.

_____

NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED *(List by Item No.)*	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.

3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.

4. Submittals requiring expeditious handling will be submitted on a separate form.

5. Separate transmittal form will be used for submittals under separate sections of the specifications.

6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".

7. Form is self-transmittal, letter of transmittal is not required.

8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.

9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

A	--	Approved as submitted.	E	--	Disapproved (See attached).
B	--	Approved, except as noted on drawings.	F	--	Receipt acknowledged.
C	--	Approved, except as noted on drawings. Refer to attached sheet resubmission required.	FX	--	Receipt acknowledged, does not comply as noted with contract requirements.
D	--	Will be returned by separate correspondence.	G	--	Other *(Specify)*

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of ENG Form 4025-R)

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01430

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-- End of Section Table of Contents --

SECTION 01430

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

STATE OF HAWAII DEPARTMENT OF HEALTH (HIDOH)

HIDOH, Chapter 43	Administrative Rules, Title 11, Community Noise Control for Oahu
HIDOH, Chapter 59	Administrative Rules, Ambient Air Quality Standards
HIDOH, Chapter 60	Administrative Rules, Air Pollution Control

1.2 GENERAL REQUIREMENTS

This section covers prevention of environmental pollution and damage as the result of construction operations under this contract and for those measures set forth in the TECHNICAL REQUIREMENTS. For the purpose of this specification, environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic, cultural and/or historical purposes. The control of environmental pollution and damage requires consideration of air, water, and land, and includes management of visual aesthetics, noise, solid waste, radiant energy and radioactive materials, as well as other pollutants.

1.2.1 Subcontractors

Assurance of compliance with this section by subcontractors will be the responsibility of the Contractor.

1.2.2 Notification

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with the aforementioned Federal, State or local laws or regulations, permits, and other elements of the Contractor's environmental protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of proposed corrective action and take such action as may be approved. If the Contractor fails to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or costs or damages allowed to the Contractor for any such suspension.

1.3 SUBMITTALS

Government approval is required for submittals with "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-18 Records

Environmental Protection Plan; GA.

Within 30 calendar days of receipt of Notice to Proceed, the Contractor shall submit in writing an environmental protection plan. Approval of the Contractor's plan will not relieve the Contractor of his responsibility for adequate and continuing control of pollutants and other environmental protection measures. The environmental protection plan shall include but not be limited to the following:

a. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.

b. Methods for protection of features to be preserved within authorized work areas. The Contractor shall prepare a listing of methods to protect resources needing protection; i.e., trees, shrubs, vines, grasses and ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, archeological, and cultural resources.

c. Procedures to be implemented to provide the required environmental protection and to comply with the applicable laws and regulations. The Contractor shall set out the procedures to be followed to correct pollution of the environment due to accident, natural causes, or failure to follow the procedures set out in accordance with the environmental protection plan.

d. Location of the solid waste disposal area.

e. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials.

f. Environmental monitoring plans for the job site, including land, water, air, and noise monitoring. The Contractor shall employ an independent qualified source, approved by the Government, to perform water, air, and noise monitoring during construction. The archaeological monitor shall be supplied by the Government conforming to Federal historic preservation standards. The Contractor's archaeological monitoring plan shall specify procedures for work stoppage, the notification procedures within the construction crew for ensuring adequate protection of potentially significant cultural resources, and the means by which such resources shall be protected once identified.

g. Traffic control plan.

h. Methods of protecting surface and ground water during construction activities.

i. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas.

j. Plan of borrow area(s).

k. Training for his personnel during the construction period.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 PROTECTION OF ENVIRONMENTAL RESOURCES

The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract shall be protected during the entire period of this contract. The Contractor shall confine his activities to areas defined by the drawings and specifications.

3.1.1 Land Resources

Prior to the beginning of any construction, the Contractor shall identify all land resources to be preserved within the Contractor's work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without special permission from the Contracting Officer. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Where such special emergency use is permitted, the Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs.

3.1.1.1 Work Area Limits

Prior to any construction, the Contractor shall mark the areas that are not required to accomplish all work to be performed under this contract. Isolated areas within the general work area which are to be saved and protected shall also be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, the markers shall be visible. The Contractor shall convey to his personnel the purpose of marking and/or protection of all necessary objects.

3.1.1.2 Protection of Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques.

3.1.1.3 Reduction of Exposure of Unprotected Erodible Soils

Earthwork brought to final grade shall be finished as indicated and specified. Side slopes and back slopes shall be protected as soon as practicable upon completion of rough grading. All earthwork shall be

planned and conducted to minimize the duration of exposure of unprotected soils. Except in instances where the constructed feature obscures borrow areas, quarries, and waste material areas, these areas shall not initially be cleared in total. Clearing of such areas shall progress in reasonably sized increments as needed to use the areas developed as approved by the Contracting Officer.

3.1.1.4 Protection of Disturbed Areas

Such methods as necessary shall be utilized to effectively prevent erosion and control sedimentation, including but not limited to the following:

a. Retardation and Control of Runoff: Runoff from the construction site shall be controlled by construction of diversion ditches, benches, and berms to retard and divert runoff to protected drainage courses, and any measures required by areawide plans approved under Paragraph 208 of the Clean Water Act.

b. Erosion and Sedimentation Control Devices: The Contractor shall construct or install all temporary and permanent erosion and sedimentation control features. Temporary erosion and sediment control measures such as berms, dikes, drains, grassing, and mulching shall be maintained until permanent drainage and erosion control facilities are completed and operative.

3.1.1.5 Contractor Facilities and Work Areas

a. Location of Field Offices, Storage, and Other Contractor Facilities: The Contractors' field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only on approval by the Contracting Officer.

b. Temporary Excavations and Embankments: Temporary excavations and embankments for plant and/or work areas shall be controlled to protect adjacent areas from despoilment.

3.1.2 Disposal of Wastes

Disposal of wastes shall be as specified in Section 01900 MISCELLANEOUS PROVISIONS and as specified hereinafter.

3.1.2.1 Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. All handling and disposal shall be conducted to prevent contamination. Segregation measures shall be employed such that no hazardous or toxic waste will become commingled with solid waste. The Contractor shall transport all solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. The Contractor shall comply with Federal, State, and local laws and regulations pertaining to the use of landfill areas.

3.1.2.2 Chemical Wastes:

Chemical wastes shall be stored in corrosion resistant containers, removed

from the work area and disposed of in accordance with Federal, State, and local laws and regulations.

3.1.2.3 Hazardous Wastes:

The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing and shall collect waste in suitable containers observing compatibility. The Contractor shall transport all hazardous waste off Government property and dispose of it in compliance with Federal and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the Contracting Officer. Cleanup and cleanup costs due to spills shall be the responsibility of the Contractor.

3.1.3 Historical, Archeological, and Cultural Resources

The Government shall provide an Archaeological Monitor for all excavation phases of the proposed construction extending into the present shoreline. It is estimated that this shall be performed along a linear distance of approximately 400-450 feet. The construction shall be phased so that most excavation cuts into the existing shoreline are performed on sequential days in order to allow for continuous archaeological monitoring. Other construction activities shall ensure in a uniform manner. If potentially significant cultural resources are identified during the archaeological monitoring, all construction activities within the areas specified by Contracting Officer's Representative shall cease, the Contractor shall notify the Contacting Officer's Representative and initiation of the Archaeological Monitoring plan. The Archaeological Monitor shall be afforded adequate time and opportunity, as determined by the Government, to complete recordation and data recovery of of the cultural resources before construction activities shall resume in the area. It shall be the responsibility of the Archaeological Monitor to adequately identify and inform the construction Contactor of the location and potential sensitivity of the cultural resources. Delays due to recordation and data recovery, if any, shall be compensated under the Special Contract Requirements. Existing historical, archaeological, and culture resources within the Contractor's work area will be so designated by the Contracting Officer if any have been identified. The contractor shall take precautions to preserve all such resources as they existed at the time they were pointed out to him. The contractor shall provide and install all protection for these resources so designated and shall be responsible for their reservation during this contract. If during excavation or other construction activities, any previously unidentified or unanticipated resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. These resources or cultural remains (prehistoric or historic surface or subsurface) include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rocks or coral alignments, pavings, wall, or other constructed featured; and any indication of agricultural or other uses. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer.

3.1.4 Water Resources

The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters. Special management techniques as set out below shall be implemented to control water pollution by the listed construction activities which are included in this contract.

3.1.4.1 Stream Crossings

Stream crossings shall be controlled during construction. Crossings shall provide movement of materials or equipment which do not violate water pollution control standards of the Federal, State or local government.

3.1.4.2 Turbidity Control

Turbidity at the project site will be controlled so as to meet the State of Hawaii Water Quality Standards (WQS) for the type and class of waters in which the project is located. Effective silt containment devices shall be deployed to isolate the construction activity, to minimize the transport of potential pollutants and to avoid the potential degradation of receiving water quality, as well as the marine ecosystem. Periodic monitoring IAW the attached Scope of Works will be conducted immediately outside the silt containment devices to verify that WQS are not being exceeded.

3.1.5 Fish and Wildlife Resources

The Contractor shall keep construction activities under surveillance, management and control to minimize interference with, disturbance to and damage of fish and wildlife. Species that require specific attention along with measures for their protection will be listed by the Contractor prior to beginning of construction operations.

3.1.6 Air Resources

The Contractor shall keep construction activities under surveillance, management and control to minimize pollution of air resources. All activities, equipment, processes, and work operated or performed by the Contractor in accomplishing the specified construction shall be in strict accordance with HIDOH, Chapter 59, HIDOH, Chapter 60, and all Federal emission and performance laws and standards. Ambient Air Quality Standards set by the Environmental Protection Agency shall be maintained for those construction operations and activities specified in this section. Special management techniques as set out below shall be implemented to control air pollution by the construction activities which are included in the contract.

3.1.6.1 Particulates

a. Dust particles, aerosols, and gaseous by-products from all construction activities, processing and preparation of materials, such as from asphaltic batch plants, shall be controlled at all times, including weekends, holidays and hours when work is not in progress.

b. The Contractor shall maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause the air pollution standards mentioned in paragraph Air Resources, herein before, to be exceeded or which would cause a hazard or a nuisance. Sprinkling, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated at such intervals as to keep the disturbed area damp at all times. The Contractor must have sufficient competent

equipment available to accomplish this task. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs.

3.1.6.2 Hydrocarbons and Carbon Monoxide

Hydrocarbons and carbon monoxide emissions from equipment shall be controlled to Federal and State allowable limits at all times.

3.1.6.3 Odors

Odors shall be controlled at all times for all construction activities, processing and preparation of materials.

3.1.6.4 Monitoring of Air Quality

Monitoring of air quality shall be the responsibility of the Contractor. All air areas affected by the construction activities shall be monitored by the Contractor.

3.1.7 Sound Intrusions

The Contractor shall keep construction activities under surveillance, and control to minimize damage to the environment by noise. The Contractor shall comply with the provisions of HIDOH, Chapter 43.

3.2 POST CONSTRUCTION CLEANUP

The Contractor shall clean up area(s) used for construction.

3.3 RESTORATION OF LANDSCAPE DAMAGE

The Contractor shall restore all landscape features damaged or destroyed during construction operations outside the limits of the approved work areas. Such restoration shall be in accordance with the plan submitted for approval by the Contracting Officer. This work will be accomplished at the Contractor's expense.

3.4 MAINTENANCE OF POLLUTION CONTROL FACILITIES

The Contractor shall maintain all constructed facilities and portable pollution control devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.5 TRAINING OF CONTRACTOR PERSONNEL IN POLLUTION CONTROL

The Contractor shall train his personnel in all phases of environmental protection. The training shall include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of facilities (vegetative covers, and instruments required for monitoring purposes) to ensure adequate and continuous environmental pollution control.

-- End of Section --

SCOPE OF WORK

MARINE WATER QUALITY MONITORING SERVICES FOR LAUNIUPOKO SHORE PROTECTION PROJECT ISLAND OF MAUI, HAWAII 20 MAY 1997 (Revised 30 Oct 1998)

1. LOCATION

The Contractor will make repeated collections of marine water samples at designated locations and depths in the vicinity of Launiupoko, Maui, Hawaii, and transport the samples to the Contractor's laboratory as necessary to complete specified analyses.

2. GENERAL SCOPE OF WORK/WORK OBJECTIVES.

The purpose of the work is to conduct marine water sampling and analyses for five specified sampling stations in the vicinity of a planned construction project at Launiupoko, Hawaii. The water sampling and testing will be performed by the Contractor to monitor specific water quality parameters before, during and after construction. The number of samples to be collected and the specific analyses to be performed shall be identical for each of 32 days (three days pre-construction, once per week during-construction and three days for post-construction). The sampling frequency for all three phases shall be once per week. The water quality sampling and testing results and the contractor's evaluation of compliance with State water quality standards for each sampling day during construction shall be transmitted in the form of a brief written laboratory report to the Authorized Representative of the Contracting Officer as soon as they become available so that they can be used by the Government to monitor the construction project. All field data and laboratory analyses shall be fully described and analyzed in a final summary report to the Government which can be used to document compliance or non-compliance with the State of Hawaii water quality standards (Reference b).

3. MAJOR WORK TASKS.

a. Coordinate with the Authorized Representative of the Contracting Officer (ARCO).

b. Establish appropriate quality control and quality assurance procedures.

c. Collect samples and associated field data.

d. Analyze samples for specified parameters.

e. Prepare and submit reports.

* Includes up to 26 samples.

4. SPECIFIC WORK TASK DETAILS.

a. Coordinate with the ARCO. The Contractor shall coordinate with the ARCO to gather project information, provide scheduling, points of contact, resolve contract difficulties, attend conferences and provide project status, and to assure timely and appropriate scheduling and completion of each of the sampling phases (pre-construction, during-construction, and post-construction).

b. Establish Appropriate Quality Control and Quality Assurance Procedures. The Contractor shall establish appropriate quality control (QC) and quality assurance (QA) procedures for this work. The QA/QC procedures shall cover the sample collection, sample transport, lab analysis and reporting of data. As a minimum, for each sampling day one trip blank (deionized water) and one duplicate station sample (blind laboratory sample) shall be subjected to the same handling and laboratory analysis as regular samples (described in section 4.c., below). The QA/QC procedures shall be described in a QA/QC Plan, which shall be submitted in writing to the ARCO for approval prior to the initiation of sampling.

c. Collect Samples and Associated Field Data. A set of water samples shall be collected by the Contractor during each of 32 separate sample days (3 pre-construction, 26 during-construction, and 3 post-construction), with the proposed sampling dates subject to the approval of the ARCO. Sampling intervals for all phases shall be once per week. The post-construction sampling shall commence not sooner than 15 days following the last day of construction (as confirmed through coordination with the ARCO) and shall be completed within 36 days of the last day of construction. The water samples shall be collected at mid-water depth because of the shallow depths at the project site. A total of 224 water samples (7 samples per set) will be collected for the monitoring study. Five (5) sampling stations will be established along the project shoreline (as shown in figure 1-3). Two stations, to monitor construction-related effects, will be located approximately 1 meter seaward of the silt containment device surroundings the construction operation at a point directly adjacent to the active construction site and separated laterally by an interval of approximately 10 meters. These two stations will move laterally, keeping abreast of the current location of construction activity as it progresses along the shoreline. The two project reaches will be constructed sequentially. The three reference stations shall be located at a comparable distance from the shoreline with one station located approximately 100 meters south near Launiupoko Wayside Park, one

located approximately 100 meters north of the construction operation and one located midway between the two project. The location of each sampling station shall be determined and recorded to an accuracy of 0.5 seconds of latitude and longitude. The collection of samples at each station shall be performed consistently with respect to depth from surface and stage of the tide, so that individual samples and sample sets represent replicates suitable for statistical analysis. Weather conditions, wave action, wind direction, tidal condition, and activities observed at each station during collection of the water samples shall also be recorded. Sample containers, preservation, and maximum holding times shall be as specified for turbidity in Table II of 40 CFR Part 136 (Reference c).

d. Analyze Samples for Specified Parameters.

(1) The Contractor shall analyze all 224 samples (5 Field, 1 QC and 1 Blank/Event) for turbidity (NTU) and total suspended solids, according to the method(s) specified in Federal regulations at 40 CFR Part 136 (Reference c) or, where this is lacking in information, then according to the method(s) of Reference a. Analysis shall include any necessary calibration of instruments, analysis of laboratory blanks, quality control samples or other mandates of the specified methods. Minimum detection limits will be as follows: turbidity, 0.01 NTU; total suspended solids, 0.01 mg/1. The Contractor may substitute other methods only with the prior approval of the ARCO.

(2) All samples must be analyzed within the relevant maximum holding times stated in Table II of 40 CFR Part 136. The Government will not accept data generated after the maximum holding times have expired unless agreed upon in advance and with the approval of the Authorized Representative of the Contracting Officer.

e. Prepare and Submit Reports. The Contractor shall provide preliminary laboratory reports (when requested by the Government), written laboratory reports, and a final written summary report.

(1) Preliminary laboratory reports may be requested by the Government. These shall be furnished at no additional charge to the Government and may be given verbally (via telephone) or by facsimile (FAX) transmission. Preliminary reports are acknowledged to be tentative, subject to confirmation or change.

(2) A brief (approximately 1-2 pages) written laboratory report shall be prepared for each sample day. Each of these reports shall list the project name; the date of sample collection; the date of laboratory analysis; the name of the laboratory performing the analysis; the initials of the analyst; a brief statement concerning the observed degree of compliance or noncompliance with state water quality standards (Reference b) as

indicated by the laboratory results and associated field data (and the apparent reason(s), if known, for any observed violations); the date of the report; and the signature of the PI. In reaching conclusions concerning degree of compliance with the state water quality standards and cause(s) of apparent violations, the Contractor shall conduct and consider the results of appropriate quantitative comparisons between the current field data obtained from project site monitoring stations and from control stations, and between the current data and baseline data (if any) previously provided by the Government. The method(s) to be used in conducting such comparisons shall include generally accepted statistical methods selected by the PI to be those which in his/her professional judgment are most appropriate for the purpose of ascertaining degree of compliance with the water quality standards. The method(s) used and results considered shall be described. The laboratory results for each sample shall be tabulated and shall include project name, sample number, station number, subsurface depth of sample, time of collection, analyze amounts and units of measure, and any relevant associated data or observations (see paragraph 4.c). Reports, which include during-construction sampling results, shall be sent to the Government within 24 hours of completion of laboratory analysis.

(3) A written final summary report shall be prepared which fully describes the results of analysis and supplemental information. This summary report shall, at the least, contain the following information:

(a) An introduction, which includes a statement of purpose and objectives and a brief description of the study design, including a figure or figures to show the project location and the locations of sampling stations relative to existing features and the construction project site.

(b) A description of the methods employed in collecting, transporting, and analyzing water samples, including QA/QC samples and procedures.

(c) Copies of the 32 individual laboratory reports (these may be placed in an appendix of the summary report).

(d) A discussion summarizing results of the laboratory analyses. This discussion shall include consideration of associated field data (see paragraphs 4.c.). Presentation of results shall include tabular and graphical presentations of the data by time, by location, and by depth. Tabular presentations of data shall include summary statistics (e.g., means, standard deviations). QA/QC results shall be tabulated and discussed separately.

(e) Conclusion(s), including a statement summarizing the degree of compliance or noncompliance with state

water quality standards (Reference b) and the probable causes of any apparent violations. In reaching conclusions concerning degree of compliance with the state water quality standards and cause(s) of apparent violations, the Contractor shall conduct and consider the results of appropriate quantitative comparisons between the current field data obtained from project site monitoring stations and from control stations, and between the current data and baseline data (if any) previously provided by the Government. The method(s) to be used in conducting such comparisons shall include generally accepted statistical methods selected by the PI to be those which in his/her professional judgment are most appropriate for the purpose of ascertaining degree of compliance with the water quality standards. The method(s) used and results considered shall be described and interpreted in the section.

(4) One unbound original of the final written summary report, on standard-sized (8.5 x 11 inch) paper and suitable for photocopying, and four (4) bound copies of same, shall be submitted to the Government within thirty (30) days of the completion of the laboratory analyses specified in this solicitation.

5. SPECIAL CONDITIONS.

a. The Contractor shall provide a Principal Investigator (PI) who is knowledgeable in the laboratories, methods, and procedures which will be used in the fulfillment of this contract. This person shall have a minimum of a masters degree in a field of science or engineering and two (2) years of environmental laboratory experience. The PI shall have a demonstrated knowledge of marine water quality testing methods and sampling requirements as well as applicable State of Hawaii and Federal regulations. Written appropriate proof of experience and academic qualifications for the PI shall be provided for Government review and approval.

b. The contractor's laboratory shall be acceptable to the State of Hawaii Department of Health.

c. The Contractor shall be responsible for the accuracy and validity of the data obtained in accomplishing this work. The Contractor without additional cost or fee to the Government, shall correct errors or deficiencies in his/her performance.

d. The Contractor shall make his/her sample storage and laboratory facilities as well as pertinent records relating to this contract available for inspection by Corps of Engineers representatives upon request.

e. The Contractor shall obtain any necessary Federal and State permits for the interisland transport of samples.

f. The Contractor shall retain unused portions of samples for a period of not less than sixty (60) days following the completion of submission of the summary report as discussed in section 4.e. above.

g. The sample containers and unused portions of samples shall be recycled or disposed of by the Contractor according to all applicable federal, state, and local regulations. The cost for disposal of samples and sample containers shall be borne by the Contractor with no additional cost to the government.

h. In event the government has the need for expert written opinion or testimony on data or reports furnished under this contract in conjunction with administrative or judicial proceedings, the Contractor shall furnish experts to provide such testimony, or attend conferences in this regard. If so required, modification to this contract will be negotiated to include appropriate terms and conditions.

i. The Contractor shall retain a copy of the laboratory report and the Raw Data Package for a minimum of seven years after submission of data. The Raw Data Package shall consist of field records, laboratory notebook pages, any relevant QA and QC data, and calibration and control data as applicable. The information must be sufficient to independently reconstruct the reported results and be in an easy-to-review format.

j. The Contractor shall take all safety measures and precautions necessary to protect his employees in accordance with OSHA standards and applicable state, local and federal regulations. The Contractor shall comply with the safety provisions of EM 385-1-1 (Reference d).

6. MATERIALS, TRANSPORTATION AND EQUIPMENT.

All materials, transportation, equipment, and personal protective equipment used by the Contractor shall be furnished by the Contractor.

7. CONFLICTS.

Any conflicts detected in any of the information furnished, shall be brought to the attention of the Authorized Representative of the Contracting Officer for resolution before proceeding with the work.

8. CHANGE IN PRINCIPAL INVESTIGATOR BY THE CONTRACTOR.

The Government shall be notified of proposed changes in the Principal Investigator and reserves the right to approve such changes on the basis of professional qualifications. Written appropriate proof of experience and academic qualifications for

the new Principal Investigator shall be provided for Government review and approval.

9. RELEASE OF INFORMATION.

The information developed, gathered and assembled in fulfillment of the contract requirements as defined in or related to the Scope of Work shall not be released by the Contractor, his consultants, his sub-consultants, his sub-contractors, or their associates without prior coordination with and approval by the Contracting Officer or his designee.

10. USE OF INFORMATION.

The information developed, gathered and assembled in fulfillment of the contract requirements as defined in or related to the Scope of Work shall become the property of the Government and shall, therefore, not be used by the Contractor for any purpose at any time without the written consent of the Contracting Officer.

11. REFERENCES.

a. American Public Health Association. 1989. Standard Methods for the Examination of Water and Wastewater, 17th Edition.

b. Hawaii Administrative Rules, Title 11, Department of Health, Chapter 54, Water Quality Standards.

c. Code of Federal Regulations (CFR), Title 40, Chapter 1 (EPA), Part 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants.

d. Department of the Army, U.S. Army Corps of Engineers. October 1992. Safety and Health Requirements Manual (EM 385-1-1).

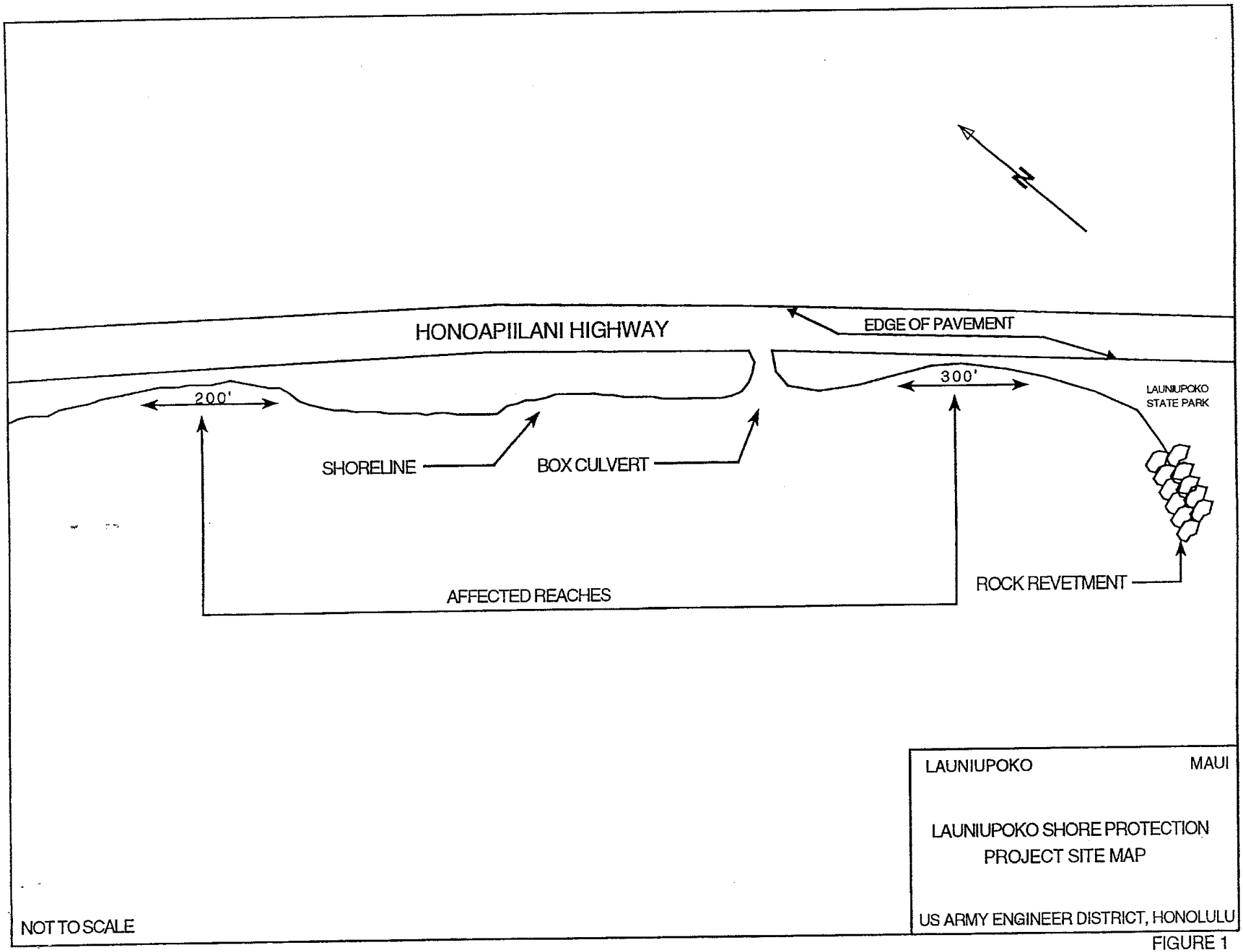
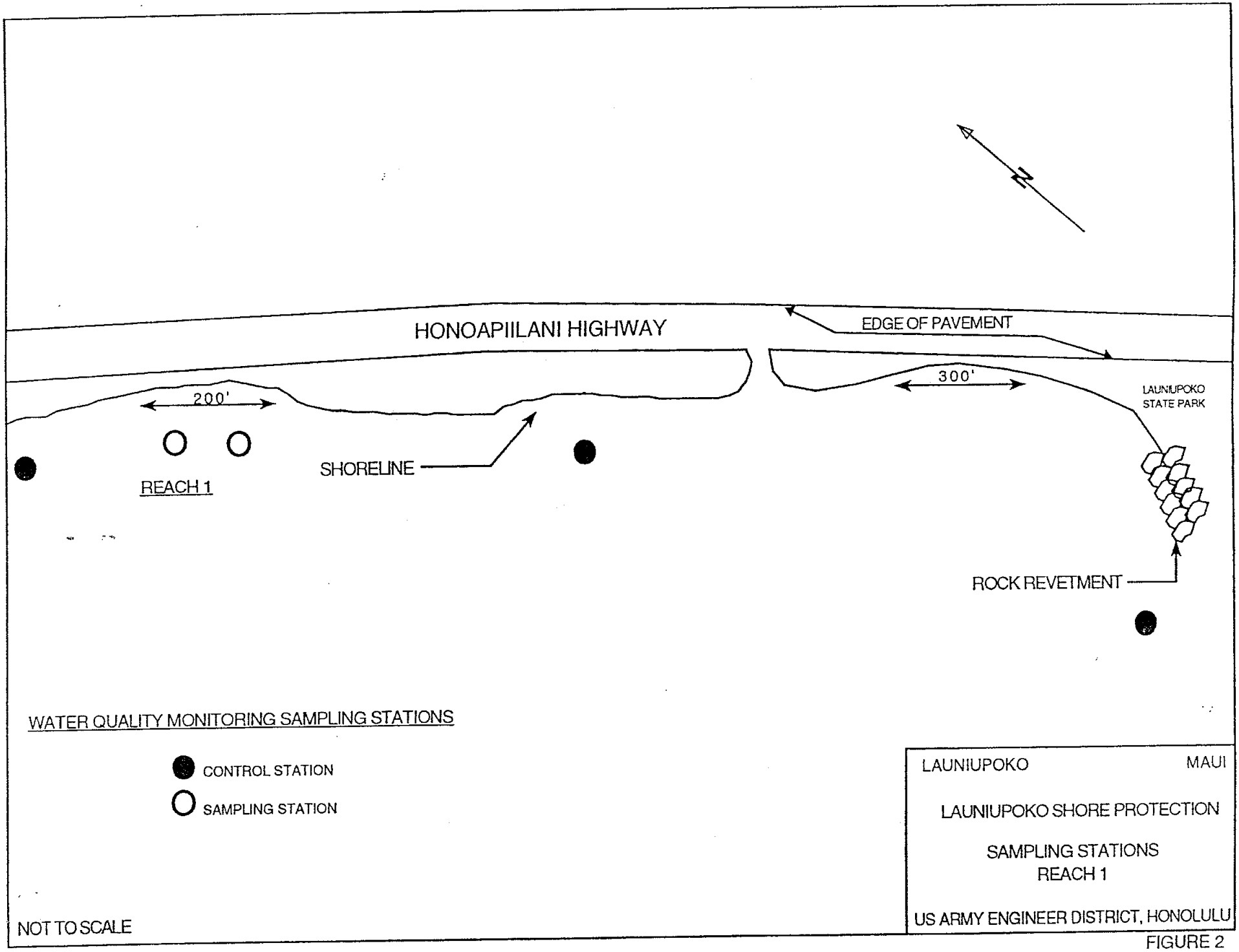

HONOAPIILANI HIGHWAY
EDGE OF PAVEMENT
200'
300'
LAUNIUPOKO
STATE PARK
SHORELINE
BOX CULVERT
AFFECTED REACHES
ROCK REVETMENT
LAUNIUPOKO
MAUI
LAUNIUPOKO SHORE PROTECTION
PROJECT SITE MAP
US ARMY ENGINEER DISTRICT, HONOLULU
NOT TO SCALE

FIGURE 1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HONOAPIILANI HIGHWAY
EDGE OF PAVEMENT
200'
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STATE PARK
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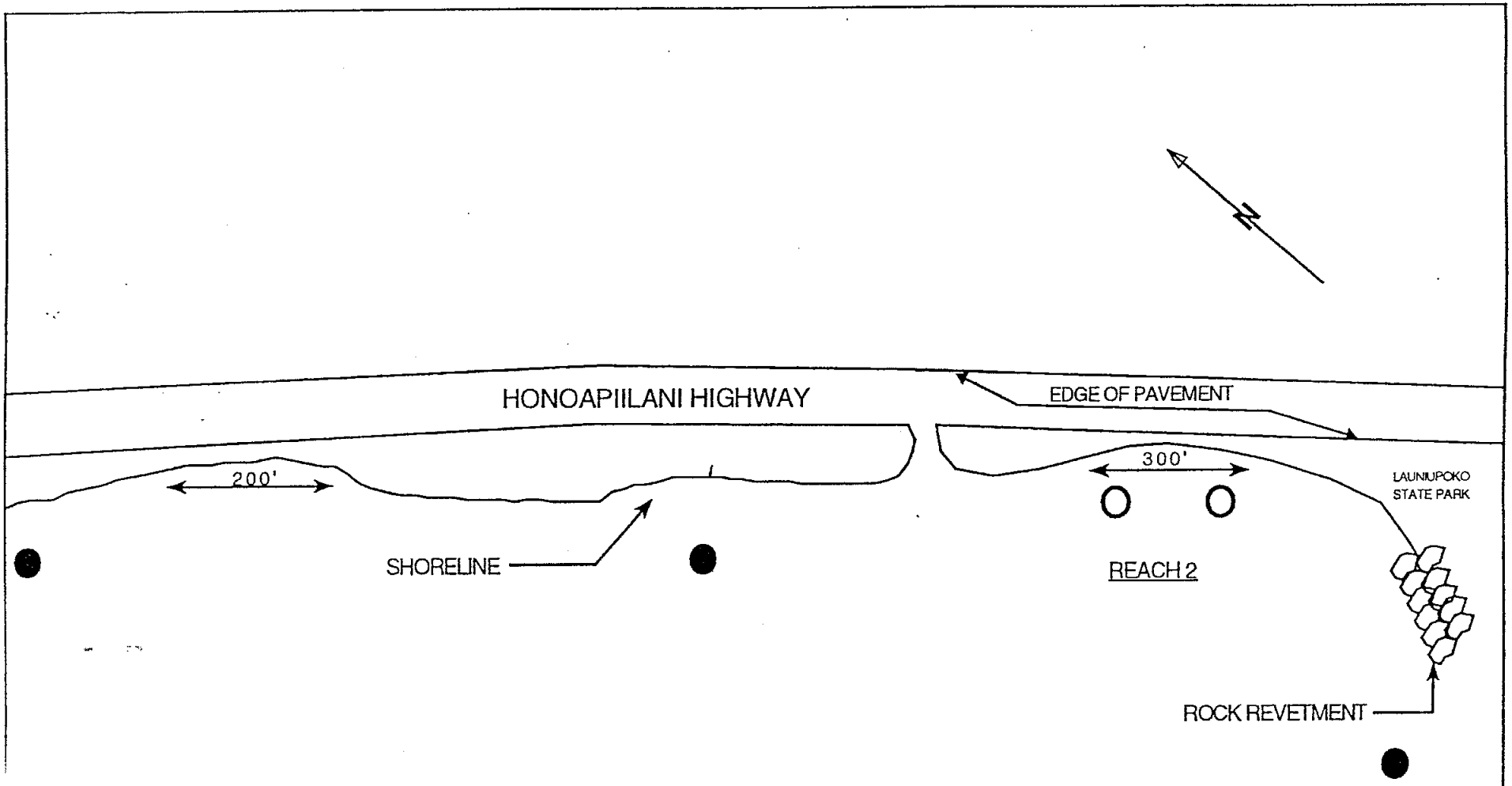
SHORELINE
ROCK REVETMENT
WATER QUALITY MONITORING SAMPLING STATIONS
CONTROL STATION
SAMPLING STATION
NOT TO SCALE
LAUNIUPOKO
MAUI
LAUNIUPOKO SHORE PROTECTION
SAMPLING STATIONS
REACH 1
US ARMY ENGINEER DISTRICT, HONOLULU

FIGURE 2



WATER QUALITY MONITORING SAMPLING STATIONS

● CONTROL STATION

○ SAMPLING STATION

NOT TO SCALE

LAUNIUPOKO MAUI

LAUNIUPOKO SHORE PROTECTION

SAMPLING STATIONS
REACH 2

US ARMY ENGINEER DISTRICT, HONOLULU

FIGURE 3

DIRECTOR'S OFFICE
DEPT. OF
TRANSPORTATION
FEB 23 8 17 AM '00

RECEIVED
FEB 23 1 45 PM '00
DEPT. OF TRANSPORTATION
HIGHWAYS DIVISION

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

FEB 22 2000

RECEIVED
00 FEB 24 P2:12

MEMORANDUM:

TO: The Honorable Kazu Hayashida, Director
Department of Transportation

ATTN: Pericles Manthos, Administrator
Highways Division

FROM: Dean Y. Uchida, Administrator
Department of Land and Natural Resources, Land Division

This is to inform you that on February 11, 2000, the Board of Land and Natural Resources approved your application for shoreline protection at Launiupoko, island of Maui, subject to the flowing conditions:

1. The applicant and contractor shall comply with all applicable statutes, ordinances, rules and regulations of the Federal, State and County governments, and applicable parts of Section 13-6-21, Administrative Rules as amended;

2. The applicant shall comply with all applicable Department of Health Administrative Rules;

3. That all conditions imposed under the approved Special Management Area Use Permit and Shoreline Setback Variance are hereby incorporated as conditions of this approval;

4. The applicant shall take appropriate mitigative measures to minimize erosion and siltation, and prevent oil, and fuel products from falling, blowing or flowing into the adjacent beach and marine environment. As an added precaution, work should be scheduled during periods of low rainfall;

5. All demolished materials shall be removed from the project site and disposed of at an approved landfill site;

6. The applicant shall implement standard Best Management Practices (BMPs), including the ability to contain and clean-up fuel, fluid or oil spills immediately. Equipment must not be refueled in the shoreline area;

7. The applicant, its successors and assigns, shall indemnify and hold the State of Hawaii harmless from and against any loss, liability, claim or demand for property damage, personal injury and death arising out of any act or omission of the applicant, its successors, assigns, officers, employees, contractors and agents under this permit or relating to or connected with the granting of this permit;

8. The applicant shall submit photographs of the site to the Department of Land and Natural Resources, Land Division, Planning Branch, upon project completion;

9. That in issuing this permit, the Department has relied on the information and data, which the permittee has provided in connection with this permit application. If, subsequent to the issuance of this permit, such information and data prove to be false, incomplete or inaccurate, this permit may be modified, suspended or revoked, in whole or in part, and/or the Department may, in addition, institute appropriate legal proceedings;

10. The applicant shall obtain the appropriate Land Disposition from the Department of Land and Natural Resources, Maui Land District, prior to initiating the project;

11. The applicant shall take measures to ensure that the public is adequately informed of the project work once it is initiated and need to avoid the project area during construction;

12. No construction materials shall be stockpiled in the marine environment;

13. No contamination of the marine environment (trash of debris disposal, etc.) shall result from project-related activities;

14. Before proceeding with any work authorized by the department or the board, the applicant shall submit four copies of the project plans and specifications to the chairperson or his authorized representative for approval for consistency with the conditions of the permit and the declarations set forth in the permit application. Three of the copies will be returned to the applicant. Plan approval by the chairperson does not constitute approval required from other agencies;

15. Any work or construction to be done on the land shall be initiated within one year of the approval of such use, in accordance with construction plans that have been signed by the chairperson, and, unless otherwise authorized, shall be completed within three years of the approval of such use. The applicant shall notify the Department of Land and Natural Resources, Land Division when construction is initiated and when construction is completed;

16. All representations relative to mitigation set forth in the accepted environmental assessment for the proposed use are incorporated as conditions of the permit;

17. Where any interference, nuisance, or harm may be caused, or hazard established by the use, the applicant shall be required to take measures to minimize or eliminate the interference, nuisance, harm, or hazard;

18. During construction, appropriate mitigation measures shall be implemented to minimize impacts to off-site roadways, utilities, and public facilities;

19. Construction activities such as excavation of a revetment toe shall be monitored by a qualified archaeologist. If cultural deposits or structural remnants indicative of a historic/archaeological site is encountered during construction, activities will cease in the immediate area of the find and the Historic Preservation Division will be notified. Mitigation measures will be decided in consultation with the Department;

20. The Department of Transportation, Highways Division shall submit 1) a long term plan for the relocation of Honoapiilani Highway, and 2) a plan based on the DOT's "Shoreline Protection Statewide Study" which is intended to look at all alternatives, including the relocation of the highway, to the Department of Land and Natural Resources, Planning Branch, within three (3 years) of the this approval;

21. That the Department of Land and Natural Resources Planning Branch be provided with copies of all coastal engineering documents required by the SMA/SSV;

22. Failure to comply with any of these conditions shall render this permit null and void; and

23. Other terms and conditions as prescribed by the chairperson.

Please acknowledge receipt of this approval, with the above noted conditions, in the space provided below. Please sign two copies. Retain one and return the other within thirty (30) days.

Should you have any questions on any of these conditions, please feel free to contact Sam Lemmo of our Planning Branch at 587-0381.

Aloha,

Dean Y. Uchida, Administrator
Land Division

Receipt acknowledged:

_____
Applicant's Signature

Date_____

cc: Maui Board Member
Maui Land Agent
DAR/HPD/Engineering
County of Maui Planning and Permitting
Dept. of Public Works
Dept. of Parks and Recreation
DOH/OHA
U.S. Army Corps of Engineers

Hwy-357

RECEIVED

'00 OCT 13 P2:15

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

DESIGN BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

OCT -9 2000

Ref:PD:TC

File:CDUA MA-2972B

MEMORANDUM

TO: Gary C.P. Choy, Acting Administrator
Highways Division

FROM: Dean Uchida, Administrator
Land Division

SUBJECT: Request for Time Extension on Conservation District Use Application (CDUA) No. MA-2972B for the Rubble Mound Revetment at Launiupoko, Lahaina, Maui

RECEIVED
00 OCT 11 8 33AM
DEPT. OF TRANSPORTATION
HIGHWAYS DIVISION

This letter acknowledges your request for a one-year extension to the processing period of the subject CDUA. The authority for granting time extensions is provided in Section 13-5-43, Hawaii Revised Statutes, which allows permittees to request time extensions for the purpose of extending the time period to allow them to comply with the permit conditions.

Section 13-5-43 (b) states: "Time extensions may be granted as determined by the Chairperson on all departmental permits and on the first request for extension of a board permit of up to two years to initiate or complete a project, based on supportive documentation from the applicant."

Therefore, the extended initiation and completion dates for your CDUA is now February 11, 2002 and February 11, 2004, respectively. Any requests for additional extensions shall be subject to the approval of the Board of Land and Natural Resources.

Should you have any questions, please contact Traver Carroll of our planning staff at 587-0439.

cc: Chairperson's Office
Oahu Board member

JAMES "KIMO" APANA
Mayor

JOHN E. MIN
Director

CLAYTON I. YOSHIDA
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PLANNING

RECEIVED
LAND DIVISION
DISTRICT OFFICE
'00 JAN -4 PM 1:23

December 29, 1999

Mr. Robert Siarot
Department of Transportation
650 Palapala Drive
Kahului, Hawaii 96732

Dear Mr. Siarot:

RE: Special Management Area Use Permit and Shoreline Setback Variance for a Rubble Mound Revetment at Launiupoko Wayside Park, TMK: 4-7-1:17, Lahaina, Maui (94/SM1-002)(95/SSV-005)

At its regular meeting on November 23, 1999, and December 14, 1999, the Maui Planning Commission (Commission) reviewed the above-mentioned request, and after due deliberation voted to grant Special Management Area and Shoreline Setback Variance Amendment for a time extension, subject to the following conditions:

1. That the applicant shall take necessary and appropriate actions to avoid water quality impacts, including, avoiding unstable slopes slumping into the water, grading properly to mitigate erosion runoff, and assuring that no debris, petroleum products, or other deleterious material is allowed to fall, flow, leach, or otherwise enter the water (original condition).

2. An archaeological monitoring plan shall be prepared and submitted to the Department of Land and Natural Resources (DLNR), State Historic Preservation Division (SHPD), for review prior to the commencement of construction activities (original condition).

3. That alternative means of disposal of grubbed material and rock shall be utilized other than disposal at the County landfills (original condition).

250 SOUTH HIGH STREET, WAILUKU, MAUI, HAWAII 96793
PLANNING DIVISION (808) 270-7735; ZONING DIVISION (808) 270-7253; FACSIMILE (808) 270-7634

4. That water, air, and noise monitoring will be conducted during construction to verify compliance with Federal, State and County requirements. Monitoring shall include water quality monitoring for turbidity and enterococci bacteria in compliance with the Department of Health, Clean Water Branch, requirements (original condition).

5. That construction materials shall be free of silt or other fine particulate material (original condition).

6. That construction shall be initiated by December 31, 2000. Further, initiation of construction shall be determined as issuance of a building permit and initiation of construction. Failure to comply within said date will automatically terminate this SSV and SMA Use Permit unless a time extension is requested no later than ninety (90) days prior to the expiration of said time period (amended condition).

7. That within a period of three (3) years, a long-term plan for highway relocation in the vicinity of Launiupoko Park to include alignment options, land acquisition efforts, cost analysis (to include economic valuation of coastal resources), funding sources, efforts to seek funding, preferred alternatives, and project implementation shall be submitted by the State Department of Transportation to the Planning Department for presentation to the Maui Planning Commission.

   Once this assessment is produced, the State shall cause to initiate a collaborative effort with the County to develop a master plan for Launiupoko Park, which shall include an assessment of shoreline structures, and relocation of the highway (original condition).

8. That the construction of the project shall be completed within three (3) years after the date of its initiation. Failure to complete construction of this project will automatically terminate the subject SSV and SMA Use Permit (original condition).

9. That the final construction shall be in accordance with preliminary plans dated December 1993, and as described in the Final Environmental Assessment for the Project, printed on May 9, 1994 (original condition).

10. That appropriate measures shall be taken during construction to mitigate the short term impacts of the project relative to soil erosion from wind and water, ambient noise levels, and traffic disruptions (original condition).

11. That the subject SMA Use Permit shall not be transferred without the prior written approval of the Maui Planning Commission. However, in the event that a contested case hearing preceded issuance of said SMA Use Permit, a public hearing shall be held upon due published notice, including actual written notice to the last known addresses of parties to said contested case and their counsel (original condition).

12. That full compliance with all applicable governmental requirements shall be rendered (original condition).

13. That the applicant shall submit to the Planning Department five (5) copies of a detailed report addressing its compliance with the conditions established with the subject SSV and SMA Use Permit. a preliminary report shall be reviewed and approved by the Planning Department prior to issuance of the grading, foundation or building permit, whichever comes first. A final compliance report shall be submitted to the Planning Department for review and approval after within one (1) month from the completion of construction (amended condition).

14. That lateral shoreline access shall be regularly maintained and readily available for public use (original condition).

15. That quarterly monitoring reports shall be submitted to the Planning Department to include the following:

    a. Quarterly monitoring of adjacent and near-adjacent properties;

b. An executive summary for each quarter to include: 1) an appraisal of the structural integrity of the shoreline structure; 2) an assessment of seasonal and current beach conditions; and 3) an ongoing log of high storm wave activities, structural damage repair activities, and drastic changes in shoreline conditions.

c. Photographs of structure and adjacent areas taken at quarterly intervals at the same location and perspective (original condition).

16. That other shoreline protection measures, to include cost, materials and effectiveness of the alternatives suggested by the Planning Director in the letter dated March 6, 1996, shall be explored by the applicant for the optional 150-foot area as illustrated on Exhibit 8, and presented to the Maui Planning Commission prior to initiation of construction (original condition).

17. That the applicant shall submit plans regarding the location of any construction-related structures such as, but not limited to trailers, sheds, equipment and storage areas and fencing to be used during the construction phase to the Maui Planning Department for review and approval (amended condition).

18. That the applicant shall develop the property in substantial compliance with the representations made to the Commission in obtaining the Special Management Area Use Permit. Failure to so develop the property may result in the revocation of the permit (amended condition).

19. That the cap on the revetment shall be smooth to enhance lateral shoreline access as specified in plans. The applicant shall recognize pedestrian safety and access when constructing the project. In future projects, the applicant is advised to consult with the West Maui Advisory Group for a pedestrian access from Launiupoko to Puamana (amended condition).

The conditions of this Special Management Area Use Permit shall be enforced pursuant to Sections 12-202-23 and 12-202-25 of the Special Management Area Rules for the Maui Planning Commission.

Futher, the Maui Planning Commission adopted the Planning Department's Report dated November 23, 1999, as amended, as its Findings of Fact, Conclusions of Law, and Decision and Order and to authorized the Planning Director to transmit said written Decision and Order on behalf of the Planning Commission.

Should you have any questions, please contact Daren Suzuki, Staff Planner, of this office at 270-7735.

Very truly yours,

Clayton I. Yoshida

for JOHN E. MIN
Planning Director

JEM:DMS:cmb

c: Clayton Yoshida, AICP, Deputy Director of Planning
Aaron Shinmoto, Planning Program Administrator (2)
Sam Lemmo, (DLNR, Honolulu)
Office of Planning, CZM Program
Daren Suzuki, Staff Planner
CZM File
Project File
General File
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BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

BRUCE S. ANDERSON, Ph.D., M.P.H.
[redacted]
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
EMD/CWB

May 6, 1999

Mr. Ray H. Jyo, P.E.
Director, Engineering Division
U.S. Army Engineer District, Honolulu
Building 230
Fort Shafter, HI 96858-5440

Attention: Mr. Stan Boc

Dear Mr. Jyo:

Subject: **Section 401 Water Quality Certification (WQC) for Launiupoko Shore Protection Project**
Maui County, Hawaii
TMK: (2) 4-7-01:17, 18, 66
File No. WQC 0000349

In accordance with the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et seq.; the "Act"), Chapters 91, 92 and 342D, Hawaii Revised Statutes, Part 121 of Title 40, Code of Federal Regulations, and Chapter 11-54 of the Hawaii Administrative Rules, the Department of Health (Department) has reviewed your Section 401 WQC application and appurtenant data relevant to water quality considerations for the discharge activities. The subject activity is authorized under the U.S. Department of the Army, Honolulu Engineer District, Civil Works authorization No. CW 95-0001. The processing of this application and the issuance of this WQC is based on the January 7, 1997 Memorandum of Agreement between the U.S. Army Corps of Engineers, Honolulu Engineer District and the Department's Clean Water Branch.

The Director of Health (Director) attests to the following statements based on information contained in the Section 401 WQC application package.

1. The Director has either:

   a. Examined the application submitted by the U.S. Army Corps of Engineers, Honolulu Engineer District, and bases its certification upon an evaluation of the information contained in such application which is relevant to water quality considerations; or

   b. Examined other information furnished by the U.S. Army Corps of Engineers, Honolulu Engineer District, sufficient to permit the statement described in Item No. 2. below.

2. With the conditions imposed in item 3., below, there is a reasonable assurance that the activity will be conducted in a manner which will not violate the Basic Water Quality Criteria applicable to all waters and the Specific Water Quality Criteria applicable to the class of State waters where the proposed discharge(s) would take place.

3. The following conditions are deemed necessary to be imposed with respect to the project activity authorized under the U.S. Army Corps of Engineers, Honolulu Engineer District, Civil Works authorization No. CW 95-0001:

   a. The discharges evaluated under this application are limited to the construction of two reaches, one 200 feet reach and one 300 feet reach, of rock revetment along the shoreline fronting Honoapiilani Highway at the north of Launiupoko Wayside Beach Park at Launiupoko, Maui. The following construction activities and estimated quantities of materials will be conducted and used to construct the revetment:

      (1) Installing and removing the silt containment device(s);

(2) Near shore grading necessary to prepare the site for revetment foundation:

- Excavation volume: 1,270 cubic yards
- Fill material from off-site: 2,210 cubic yards

(3) Installation of geotextile fabric, bedding stones, armor stones and fill material:

- 50-150 pound size stones: 2,900 tons
- 1,000-2,000 pound size stones: 2,600 tons
- 3 ton size toe stones: 560 tons

The revetment will be constructed with a slope of one vertical and two horizontal.

b. This Section 401 WQC shall become valid only when the following conditions have been satisfied:

(1) A complete site-specific Environmental Protection Plan has been submitted to the Clean Water Branch for review and comment and all related concern(s) and comment(s) are properly addressed to the Director's satisfaction. A copy of the final site-specific Environmental Protection Plan shall be submitted to the Clean Water Branch.

The Clean Water Branch shall have at least 30 days to review and comment after receiving a copy of the complete Environmental Protection Plan.

A complete Environmental Protection Plan shall, at a minimum, include the following information:

(a) A project-related site-specific, and construction method-specific Best Management Practices Plan which shall, at a minimum, include the following descriptions:

(i) Site characterization;

(ii) Construction sequence;

(iii) Construction method;

(iv) Characteristics of the discharge and potential pollutants associated with the proposed construction activity; and

(v) Proposed control measures or treatment;

(b) An applicable monitoring plan;

(c) A dewatering, treatment and effluent monitoring plan, if applicable; and

(d) Applicable mitigative/compensatory measures, controls or treatment measures, or contingency plan needed because of the construction method used or other unforeseen circumstances;

c. This Section 401 WQC:

(1) Shall remain valid for two (2) years from the date of issuance or until the applicable State Water Quality Standards is revised or modified whichever is earlier. If the applicable State Water Quality Standards is revised or modified during the two (2) year period and such that the activity complies with the revisions or modifications, this certification shall continue to be valid for the remainder of the two (2) year period.

The Department may, on a case-by-case basis and upon the applicant's written request, administratively extend the expiration date of

this Section 401 WQC for the subject project, if the Department determines that there are no significant change(s) to the project scope and the change(s) will not, either individually or accumulatively, cause adverse impacts to the receiving water quality.

(2) May be revoked at the Director's discretion or when any of the following is identified:

(a) Water quality standards applicable to the waters into which the activity may discharge are subsequently established before the activity is completed; or the Director determines that the activity is violating water quality standards.

The Clean Water Branch shall notify the U.S. Army Corps of Engineers, Honolulu Engineer District, of the violation or noncompliance with the new water quality standards. The U.S. Army Corps of Engineers, Honolulu Engineer District, shall cease the violation or noncompliance within one hundred eighty days of the date of the notice. If the U.S. Army Corps of Engineers, Honolulu Engineer District, fails within one hundred eighty days of the date of the notice to cease the violation or noncompliance, the Director may revoke this certification, at the Director's discretion;

(b) The discharge(s) from the activity is in violation or noncompliance with any existing water quality standards or condition of this Section 401 WQC. The Clean Water Branch shall notify the U.S. Army Corps of Engineers, Honolulu Engineer District, of the violation or noncompliance. The U.S. Army Corps of Engineers, Honolulu Engineer

District, shall cease the violation or the noncompliance within seven (7) days of the date of the notice. If the U.S. Army Corps of Engineers, Honolulu Engineer District, fails within seven (7) days of the date of the notice to cease the violation or noncompliance, the Director may revoke this certification, at the Director's discretion;

(c) The Section 401 WQC was obtained by misrepresentation, or there was a failure to disclose fully all relevant facts;

(d) There is a change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge; or

(e) It is in the public interest.

d. The U.S. Army Corps of Engineers, Honolulu Engineer District, shall:

(1) Invite the Department's representative(s) to attend the partnering, pre-construction or any other similar type of meeting that is established for the proposed construction activities;

(2) Notify the Clean Water Branch (by fax at (808) 586-4352) at least three (3) working days before any construction work is to begin;

(3) Comply and shall also require the contractor(s) to comply with applicable specifications, schedules, procedures, approved Environmental Protection Plan and any other project construction related requirements, or information contained in the Section 401 WQC application dated September 1, 1998 and subsequent submittals;

(4) Conduct or contract with a qualified laboratory/environmental consultant to conduct applicable monitoring as specified in the site-specific Environmental Protection Plan. The applicant shall use test methods promulgated in 40 CFR Part 136 effective on July 1, 1996, and, when applicable, the chemical methodology for sea water analyses (see Hawaii Administrative Rule (HAR) Chapter 11-54-10). The detection limits of the test methods used shall be equal to or lower than the applicable water quality standards as specified in HAR Chapter 11-54. For situations where the applicable water quality standard is below the detection limits of the available test methods, the test method which has the detection limit closest to the applicable water quality standards shall be used. If a test method has not been promulgated for a particular parameter, the applicant may submit an application through the director for approval of an alternate test procedure by following 40 CFR 136.4.

(5) The director may, at the director's own discretion or upon written request from the applicant and on a case-by-case basis, require the applicant to modify the monitoring frequency(ies) or change the sampling locations, as appropriate. If a written request is submitted for the reduction of monitoring frequency(ies), it shall be accompanied by an assessment of monitoring results which shall clearly demonstrate that the project construction activity related discharge has fully complied with the applicable water quality standards.

(6) Ensure that silt curtain(s) or other appropriate and effective silt containment device(s) be properly deployed prior to the commencement of any section of the in-water construction work; be properly maintained throughout the entire period of the section of the in-water construction work;

and not be removed until the section of the in-water work is completed and the water quality in the affected area has returned to its pre-construction condition;

(7) Ensure that all "discharges" associated with the proposed activities be conducted in a manner that will comply with the "Basic Water Quality Criteria Applicable to All Waters" as specified in Section 11-54-04(a), Hawaii Administrative Rules;

(8) Ensure that all material(s) placed or to be placed in State waters be free of waste metal products, organic materials, debris and any pollutants at toxic or potentially hazardous concentrations to aquatic life as identified in Section 11-54-04(b), Hawaii Administrative Rules;

(9) Ensure that construction debris be contained and prevented from entering or re-entering State waters;

(10) Cease immediately the portion of the construction work or discharge that is causing noncompliance with Section 11-54-04(a) or Section 11-54-04(b) of the Hawaii Administrative Rules.

The U.S. Army Corps of Engineers, Honolulu Engineer District, shall not resume the portion of the construction work or discharge until adequate mitigative measures are implemented and appropriate corrective actions are taken and concurred by the Department;

(11) Report immediately any spill(s) or other contamination(s) that occurs at the project site to the Clean Water Branch;

(12) Notify the Clean Water Branch within 14 days after the completion of the proposed construction activities;

(13) Ensure that all temporarily constructed facilities or structures, including the silt containment device(s), be removed immediately after the completion of the in-water construction and the water quality in the affected area has returned to its pre-construction condition;

(14) Comply with all new water quality standards as adopted by the Department.

e. Clearing and grubbing shall be held to the minimum.

f. The effectiveness and adequacy of the implemented environmental protection measures shall be reviewed and updated as often as needed. Any change(s) to the approved Environmental Protection Plan or Applicable Monitoring Plan or correction(s) or modification(s) to information already on file with the Department shall be submitted to the Clean Water Branch, for review and comment, as such change(s), correction(s) or modification(s) arise. The U.S. Army Corps of Engineers, Honolulu Engineer District, shall properly address the Clean Water Branch's comment(s) and/or concern(s) to the Director's satisfaction before such change(s), correction(s) or modification(s) become effective.

g. By applying for and accepting the Section 401 WQC, the U.S. Army Corps of Engineers, Honolulu Engineer District, agrees that the Department may conduct routine inspection of the construction site in accordance with Section 342D-8 of the Hawaii Revised Statutes.

h. Demolition debris and/or dredged spoils shall be removed from the aquatic environment and be disposed of at the upland State or County approved sites. A Solid Waste Disclosure Form for Construction Sites shall be completed and returned to the Department's Office of Solid Waste Management. No construction material or construction-related materials shall be stockpiled, stored or placed in the aquatic environment or stored or placed in ways that will disturb the aquatic environment.

i. Return flow or runoff from the dredged spoil dewatering process or from the stockpiling site shall be contained on land and not be allowed to enter State waters. Should the discharge of the return flow or runoff from the dredged spoil dewatering site be unavoidable, it shall be properly handled in such a manner that the effluent discharges will comply with the applicable State Water Quality Standards. A detailed dewatering design and discharge plan, including applicable effluent monitoring program, shall be submitted to the Clean Water Branch for review and comment.

j. The U.S. Army Corps of Engineers, Honolulu Engineer District, shall obtain a National Pollutant Discharge Elimination System permit for any discharge(s) that is regulated pursuant to Section 402 of the "Act", Chapter 342 of the Hawaii Revised Statutes, Title 40 Code of Federal Regulations, and Chapter 11-55 of the Hawaii Administrative Rules.

The applicant published a public notice of proposed certification in the Maui News on February 10, 1999 for the subject activities.

After consideration of the expressed views of all interested persons and agencies and pertinent State Statutes and Rules, the Department hereby issues this Section 401 WQC to the Department of Army. This action does not constitute a significant change from the tentative determination set forth in the public notice.

The Department may, on a case by case basis and upon the applicant's written request, administratively extend the expiration date of the WQC if the Department determines that there are no significant changes to the project scope and the changes will not, either individually or cumulatively, cause adverse impact to the receiving water quality.

Should you have any questions, please contact Ms. Hong Chen, Engineering Section of the Clean Water Branch, at (808)586-4309.

Sincerely,

GARY GILL
Deputy Director for
Environmental Health

Enclosure: Solid Waste Disclosure Form for Construction Sites

c: State DBEDT, CZM Program (w/o encl.)

STATE OF HAWAII
DEPARTMENT OF HEALTH
OFFICE OF SOLID WASTE MANAGEMENT

Solid Waste Disclosure Form for Construction Sites

The following form shall be filled out for construction projects either identified as under 40 CFR 122.26(b)(14)(x) or produces (or will produce) dredged spoils. A response must be provided for each item. If an item is not relevant to the activity, indicate by "Not Applicable" (N/A), with a short comment.

This form will help the Department of Health, Office of Solid Waste Management (OSWM), to identify sources of construction/ demolition and site clearing debris. The Department is responsible for the proper disposal of such solid waste. Violators of the regulations Title 11, Chapter 58, "Solid Waste Management Control," are subject to enforcement, corrective actions, and fines.

Completed forms shall be mailed to the Department of Health, Environmental Management Division, OSWM, P.O. Box 3378, Honolulu, Hawaii 96801-3378. Questions regarding this form should be directed to OSWM at 586-4240.

I. Site Information

A. Address of site:_____

B. Owner of site: _____

Address of owner:_____

_____

Phone Number: _____

C. Tax map key: _____
Size of site: (in acres) _____

D. Department of Public Work's grading permit no.:_____

_____

II. Site Activity Information

A. State the kinds of site clearing activities to be completed. State final use of site. Describe the general topography of site, i.e., whether level or sloped._____

_____

_____

_____

B. Describe structure on site (if none, indicate n/a)._____

_____

_____

If structures exist, are they to be demolished or removed? ___yes ___no

C. Describe vegetation on site:_____

_____

_____

III. Contractor Information

A. General Contractor:_____

Contact person:_____Phone:_____

B. Site clearing contractor:_____

Contact person:_____Phone:_____

C. Hauling contractor:_____

Contact person:_____Phone:_____

D. State destination of:

1. Building demolition materials:_____

_____

_____

2. Clear and grub materials:_____

_____

_____

3. Dredged spoils:_____

_____

_____

Name of person completing form:_____

Company:_____

Phone Number:_____

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SECTION 01451

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740	(1996) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(1995b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with quality requirements specified in the contract. The project superintendent in this context shall mean the individual with the responsibility for the overall management of the project including quality and production.

3.2 QUALITY CONTROL PLAN

3.2.1 General

The Contractor shall furnish for review by the Government, not later than

30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Government will consider an interim plan for the first 90 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.2 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function. Technicians responsible for sampling and testing of concrete shall be certified by the American Concrete Institute (ACI) or the Concrete Technicians Association of Hawaii (CTAH). Proof of certification shall be included in the CQC Plan. Personnel qualifications may be furnished incrementally as the work progresses, but in no case, less than fourteen (14) calendar days before personnel are required on the job.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test.

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from

identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 7 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 General

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure contract compliance. The Contractor shall provide a CQC organization which shall be at the site at all times during progress of the work and with complete authority to take any action necessary to ensure compliance with the

contract. All CQC staff members shall be subject to acceptance by the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a construction person with a minimum of 5 years in related work. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned as System Manager, but may have duties as project superintendent in addition to quality control. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirement for the alternate shall be the same as for the designated CQC Systems Manager.

3.4.3 CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager. If it is subsequently determined by the Contracting Officer that the minimum contract CQC requirements are not being met, the Contractor may be required to provide additional staff personnel to the CQC organization at no cost to the Government.

3.4.4 Additional Requirement

The CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors" within the past 5 years. This course is periodically offered at the General Contractors Association of Hawaii.

3.4.5 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS

Submittals shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals are in compliance with the contract requirements.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

a. A review of each paragraph of applicable specifications.

b. A review of the contract drawings.

c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. A review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. The Government shall be notified at least 7 days advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample

panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government shall be notified at least 7 days in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if the quality of on-going work is unacceptable, if there are changes in the applicable CQC staff, onsite production supervision or work crew, if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall obtain the services of an industry recognized testing laboratory, or may establish a testing laboratory at the project site acceptable to the Contracting Officer. However, tests contractually required to be performed by an industry recognized testing laboratory shall not be accomplished by the Contractor established on-site laboratory. The Contractor shall perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Laboratory Accreditation

The testing laboratory performing the actual testing on the project shall be accredited by one of the following laboratory accreditation authorities:

American Association of State Highway and Transportation Officials
National Voluntary Laboratory Accreditation Program
American Association for Laboratory Accreditation
Washington Association of Building Officials

The testing laboratory shall submit an acknowledgement letter from one of the listed laboratory accreditation authorities indicating that the application for accreditation has been received and the accreditation process started.

3.7.2.2 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.3 Capability Recheck

If the selected laboratory fails the capability check, the Contractor shall reimburse reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to a testing laboratory on the Island of Oahu, State of Hawaii, designated by the Contracting Officer. Coordination for each specific test, exact delivery location, and dates will be made through the Government field office.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the completion of all work or any increment thereof established by a completion time stated in the Special Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the CQC System Manager shall conduct an inspection of the work and develop a punch list of items which do not conform to the approved drawings and specifications. Such a list of deficiencies shall be included in the CQC documentation, as required by paragraph DOCUMENTATION below, and shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform this inspection to verify that the facility is complete and ready to be occupied. The QC Manager shall develop a punch list of items which do not conform to the contract documents. The Government will review the punch list and add to or correct the items listed. The QC Manager shall incorporate Government comments and provide a Pre-Final Punch List. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at this inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional

inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

a. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals reviewed, with contract reference, by whom, and action taken.

g. Off-site surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

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SECTION 01780

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

SD-18 Records

As-Built Drawings; FIO.

Drawings showing final as-built conditions of the project. The final CADD as-built drawings shall consist of one set of electronic CADD drawing files in the specified format, one set of original drawings, 2 sets of prints of the originals, and one set of the Government accepted working as-built drawings.

As-Built Record of Equipment and Materials; FIO.

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

Warranty Management Plan; FIO.

One set of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

Warranty Tags; FIO.

Two record copies of the warranty tags showing the layout and design.

Final Clean-Up; FIO.

Two copies of the listing of completed final clean-up items.

1.2 PROJECT RECORD DOCUMENTS

1.2.1 As-Built Drawings

This paragraph covers as-built drawings complete, as a requirement of the contract. The terms "drawings," "contract drawings," "drawing files," "working as-built drawings" and "final as-built drawings" refer to contract drawings which are revised to be used for final as-built drawings.

1.2.1.1 Government Furnished Materials

One set of electronic CADD files in the specified software and format revised to reflect all bid amendments will be provided by the Government at the preconstruction conference for projects requiring CADD file as-built drawings.

1.2.1.2 Working As-Built and Final As-Built Drawings

The Contractor shall maintain 2 sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. These working as-built marked drawings shall be kept current on a daily basis and at least one set shall be available on the jobsite at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. At the final inspection or upon beneficial occupancy of the facility by the user, whichever comes first. The Contractor shall provide one of the two sets of working as-built drawings to the COR for turnover with the facility. This set will serve as an advance/interim working set for the occupant of the completed facility; until such time that the final as-built drawings are furnished to them. Final as-built drawings shall be prepared after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). The working as-built marked drawings and final as-built drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working and final as-built drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the as-built drawings. This monthly deduction will continue until an agreement is reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. The working and final as-built drawings shall show, but shall not be limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Valves, splice boxes and similar appurtenances shall be located by dimensioning along the utility run from a reference point. The average depth below the surface of each run shall also be recorded.

b. The location and dimensions of any changes within the building structure.

c. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

d. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

e. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

f. Changes or modifications which result from the final inspection.

g. Where contract drawings or specifications present options, only the option selected for construction shall be shown on the final as-built drawings.

h. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, the Contractor shall furnish a contour map of the final borrow pit/spoil area elevations.

i. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

j. Modifications (change order price shall include the Contractor's cost to change working and final as-built drawings to reflect modifications) and compliance with the following procedures.

(1) Directions in the modification for posting descriptive changes shall be followed.

(2) A Modification Circle shall be placed at the location of each deletion.

(3) For new details or sections which are added to a drawing, a Modification Circle shall be placed by the detail or section title.

(4) For minor changes, a Modification Circle shall be placed by the area changed on the drawing (each location).

(5) For major changes to a drawing, a Modification Circle shall be placed by the title of the affected plan, section, or detail at each location.

(6) For changes to schedules or drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.

(7) The Modification Circle size shall be 1/2 inch diameter unless the area where the circle is to be placed is crowded. Smaller size circle shall be used for crowded areas.

1.2.1.3 Drawing Preparation

The as-built drawings shall be modified as may be necessary to correctly show the features of the project as it has been constructed by bringing the contract set into agreement with Government accepted working as-built drawings, and adding such additional drawings as may be necessary. These working as-built marked drawings shall be neat, legible and accurate. These drawings are part of the permanent records of this project and shall be returned by the Contractor to the Contracting Officer after final acceptance by the Government. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at no expense to the Government.

1.2.1.4 Computer Aided Design and Drafting (CADD) Drawings

Only personnel proficient in the preparation of CADD drawings shall be employed to modify the contract drawings or prepare additional new

drawings. Additions and corrections to the contract drawings shall be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols shall be the same as the original line colors, line weights, lettering, layering conventions, and symbols. If additional drawings are required, they shall be prepared using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final as-built drawings shall be identical to that used on the contract drawings. Additions and corrections to the contract drawings shall be accomplished using CADD files. The Contractor will be furnished Microstation CADD files and pentable. The electronic files will be supplied on compact disc, read-only memory (CD-ROM). The Contractor shall be responsible for providing all program files and hardware necessary to prepare final as-built drawings. The Contracting Officer will review final as-built drawings for accuracy and the Contractor shall make required corrections, changes, additions, and deletions.

a. CADD colors shall be the "base" colors of red, green, and blue. Color code for changes shall be as follows:

(1) Deletions (red) - Deleted graphic items (lines) shall be colored red with red lettering in notes and leaders.

(2) Additions (Green) - Added items shall be drawn in green with green lettering in notes and leaders.

(3) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes shall be in blue.

b. All changes to the contract drawing files shall be made on the layer/level as the original item. There shall be no deletions of existing lines; existing lines shall be over struck in red. Additions shall be in green with line weights the same as the drawing. Special notes shall be in blue on layer #63.

c. When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 3/16 inch high. All other contract drawings shall be marked either "AS-Built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. Original contract drawings shall be dated in the revision block.

d. Within 10 days after Government acceptance of all of the working as-built drawings for a phase of work, the Contractor shall prepare the final CADD as-built drawings for that phase of work and submit two sets of blue-lined prints of these drawings for Government review. The Government will promptly return one set of prints annotated with any necessary corrections. Within 7 days the Contractor shall revise the CADD files accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 10 days of substantial completion of all phases of work, the Contractor shall submit the final as-built drawing package for the entire project. The submittal shall consist of one set of electronic files on compact disc, read-only memory (CD-ROM), one set of originals, two sets of prints and one set of the Government annotated and accepted working as-built drawings. They shall be complete in all details and identical in form and function to the contract drawing files supplied by the Government. Any transactions or adjustments necessary to accomplish this is the responsibility of the

Contractor. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CADD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final acceptance. Failure to submit final as-built drawing files and working as-built marked drawings as specified shall be cause for withholding any payment due the Contractor under this contract. Acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

1.2.1.5 Payment

No separate payment will be made for as-built drawings required under this contract, and all costs accrued in connection with such drawings shall be considered a subsidiary obligation of the Contractor.

1.2.2 As-Built Record of Equipment and Materials

The Contractor shall furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Two sets of final record of equipment and materials shall be submitted 10 days after final inspection. The designations shall be keyed to the related area depicted on the contract drawings. The record shall list the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA

Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

1.2.3 Final Approved Shop Drawings

The Contractor shall furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.2.4 Real Property Equipment

The Contractor shall furnish a list of installed equipment furnished under this contract. The list shall include all information usually listed on manufacturer's name plate. The "EQUIPMENT-IN-PLACE LIST" shall include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts list, manufacturer's catalog, and warranty. A draft list shall be furnished at time of transfer. The final list shall be furnished 30 days after transfer of the completed facility.

1.3 WARRANTY MANAGEMENT

1.3.1 Warranty Management Plan

The Contractor shall develop a warranty management plan. At least 30 days before the planned pre-warranty conference, the Contractor shall submit the warranty management plan for Government approval. The warranty management plan shall include all required actions and documents to assure that the Government receives all warranties to which it is entitled, in accordance

with the Contract Clause, WARRANTY OF CONSTRUCTION. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below shall include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase shall be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Approved information shall be assembled in a binder and shall be turned over to the Government upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. A joint 4 month and 9 month warranty inspection shall be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Information contained in the warranty management plan shall include, but shall not be limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

c. A list for each warranted equipment, item, feature of construction or system indicating:

1. Name of item.
2. Model and serial numbers.
3. Location where installed.
4. Name and phone numbers of manufacturers or suppliers.
5. Names, addresses and telephone numbers of sources of spare parts.
6. Warranties and terms of warranty. This shall include one-year overall warranty of construction. Items which have extended warranties shall be indicated with separate warranty expiration dates.
7. Cross-reference to warranty certificates as applicable.
8. Starting point and duration of warranty period.
9. Summary of maintenance procedures required to continue the warranty in force.
10. Cross-reference to specific pertinent Operation and Maintenance manuals.
11. Organization, names and phone numbers of persons to call for warranty service.
12. Typical response time and repair time expected for various warranted equipment.

d. The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

e. Procedure and status of tagging of all equipment covered by extended warranties.

f. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.3.2 Performance Bond

The Contractor's Performance Bond shall remain in effect throughout the construction period, and during the life of any guaranty required under the Contract Performance Bond, Standard Form 25.

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others. After completion of the construction warranty work, charges will be made to the remaining construction warranty funds of expenses which the Government incurred while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government, at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, the Contractor shall respond in a timely manner. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.3.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty shall be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor shall furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, shall be continuously available, and shall be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.3.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, the Contractor shall respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. The Contractor shall submit a report on any warranty item that has been repaired during the warranty period. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the Government will perform the work and backcharge the construction warranty payment item established.

a. First Priority Code 1. Perform onsite inspection to evaluate

situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

1.4 FINAL CLEANING

Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, and construction facilities removed. A list of completed clean-up items shall be submitted on the day of final inspection.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

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SECTION 01900

MISCELLANEOUS PROVISIONS

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having a "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Equipment Data; FIO.

A list of all equipment furnished under this contract. This list shall include, but not be limited to, each piece of equipment with a serial number, and shall include all information shown on the manufacturer's nameplate, so as to positively identify the piece of equipment. This list shall also include the cost of each piece of equipment (less installation costs) F.O.B. construction site. This list shall be furnished as soon as possible after equipment is purchased. The list shall consist of one (1) reproducible and three (3) copies, and shall be furnished to the Contracting Officer not later than thirty (30) calendar days prior to completion of any segment of the contract work which has an incremental completion date.

SD-04 Drawings

As-Built Drawings; FIO.

SD-07 Schedules

Progress Chart; GA.

The Contractor shall prepare and submit for approval by the Contracting Officer a progress chart in accordance with the CONTRACT CLAUSE entitled "SCHEDULE FOR CONSTRUCTION CONTRACTS" twenty-one (21) calendar days prior to initiation of any work. Any material change to the progress chart must be approved in writing in advance by the Contracting Officer. Any proposed changes to the approved schedule shall be requested by the Contractor in writing a minimum of fourteen (14) calendar days prior to the proposed start of work.

SD-09 Reports

Inspection of Existing Conditions; FIO.

A written report with color photographs noting the condition of the existing facilities at the time of the inspection. One copy of the report including photographs shall be submitted to Contracting Officer, prior to construction.

SD-13 Certificate

Products Containing Recovered Materials; FIO.

The Contractor shall submit manufacturer's certification attesting that product meets or exceeds EPA's recovered material guidelines.

SD-18 Records

Dust Control; GA.

Method(s) of dust control.

Excavation/Trenching Clearance; FIO.

Prior to start of any excavation or trenching work, the Contractor shall obtain clearance, in writing, from the appropriate communications agency and base or area engineer. Copies of all correspondence shall be provided the Contracting Officer. Normal coordination time for obtaining the necessary permits is approximately fifteen (15) calendar days. The Contractor shall advise the Contracting Officer promptly when it appears that the normal coordination time will be exceeded.

Condition of Contractor's Operation or Storage Area; FIO.

The Contractor shall submit to the Contracting Officer photographs and/or videos depicting the condition of the Contractor's Operation or Storage Area.

1.2 CONTRACTOR QUALITY CONTROL

To assure compliance with contract requirements, the Contractor shall establish and maintain quality control for materials and work covered by all sections of the TECHNICAL REQUIREMENTS in accordance with Section 01451 CONTRACTOR QUALITY CONTROL. Records shall be maintained for all operations including sampling and testing.

1.3 AS-BUILT DRAWINGS

As-built drawings shall be in accordance with Section 01780 CLOSEOUT SUBMITTAL.

1.4 DUST CONTROL

The amount of dust resulting from the Contractor's work shall be controlled to prevent the spread of dust to occupied portions of the construction site and to avoid creation of a nuisance in the surrounding area. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as flooding and pollution. Measures shall also be taken for dust control along haul routes and equipment parking areas.

1.5 PROTECTION

The Contractor shall take all necessary precautions to insure that no damages to private or public property will result from his operations. Any such damages shall be repaired or property replaced by the Contractor in accordance with the CONTRACT CLAUSES entitled "PERMITS AND RESPONSIBILITIES" and "PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS", without delay, and at no cost to

the Government.

1.5.1 Warning Signs and Barricades

The Contractor shall be responsible for posting warning signs or erecting temporary barricades to provide for safe conduct of work and protection of property.

1.5.2 Protection of Grassed and Landscaped Areas

The Contractor's vehicles shall be restricted to paved roadways and driveways. Vehicles shall not be driven or parked on grassed and/or landscaped areas except when absolutely necessary for the performance of the work and approved in advance by the Contracting Officer. Grassed or landscaped areas damaged by the Contractor shall be restored to their original condition without delay and at no cost to the Government.

1.5.3 Protection of Trees and Plants

Where necessary, tree branches and plants interfering with the work may be temporarily tied back by the Contractor to permit accomplishment of the work in a convenient manner, so long as they will not be permanently damaged thereby. If this is not feasible, they may be pruned, subject to written approval by the Contracting Officer.

1.6 RESTORATION WORK

Existing conditions or areas damaged or disturbed by the Contractor's operations shall be restored to their original condition, or near original condition as possible, to the satisfaction of the Contracting Officer.

1.7 REMOVAL AND DISPOSAL

1.7.1 Title to Materials

Title to all materials and equipment to be removed, except as indicated or specified otherwise, is vested in the Contractor upon receipt of notice to proceed. The Government will not be responsible for the condition, loss or damage to such property after the Contractor's receipt of notice to proceed. Items indicated to be removed shall be removed and disposed of by the Contractor outside the limits of Government-controlled property at the Contractor's responsibility and expense before the completion and final acceptance of the work, and such materials shall not be sold on the site.

1.7.2 Rubbish and Debris

Rubbish and debris shall be removed from Government-controlled property daily unless otherwise directed, so as not to allow accumulation. Materials that cannot be removed daily shall be stored in areas designated by the Contracting Officer.

1.8 INTERFERENCE WITH GOVERNMENT OPERATIONS

The Contractor shall establish work procedures and methods to prevent interference with existing operations within or adjacent to the construction area. Free passage into adjoining or adjacent buildings not in the contract will not be permitted except as approved by the Contracting Officer. Procedures and methods shall also provide for safe conduct of work and protection of property which is to remain undisturbed.

1.8.1 Coordination

The Contractor shall coordinate all work with the Contracting Officer to minimize interruption and inconvenience to the occupants or to the Government. Scheduling and programming of work will be established during the pre-construction conference.

1.8.2 Materials and Equipment

All materials and equipment required to complete the project shall be on hand before work is started.

1.8.3 Utilities and Facilities

All utilities and facilities within the area shall remain operable and shall not be affected by the Contractor's work, unless otherwise approved in writing in advance by the Contracting Officer.

1.9 CONTRACTOR'S OPERATIONS OR STORAGE AREA

An open operations and storage area of approximately 200 feet by 25 feet (northeast of the edge of Honoapiilani Highway) shall be designated in the field in the vicinity of the project. The Contractor's operations shall not interfere with two-way traffic on Honoapiilani Hwy. If any part of Honoapiilani Hwy must be used for construction activities an AC paved detour road with appropriate signs shall conform to the Federal Highway Administration Manual on Uniform Traffic Control Devices Traffic Control Devices handbook, Work zone Traffic Control Standards 7 Guidelines, and the Hawaii Statewide Uniform Design manual for Streets and Highways. If a detour road is used, a Traffic control plan shall be submitted for approval. The traffic control plan shall be coordinated with and approved by the State of Hawaii Highways Department. The disposition of the detour road upon project completion shall be coordinated with the State of Hawaii Highways Department. The Contractor shall be responsible for the security necessary for protection of his equipment and materials, and shall maintain the area free of debris. No rusty or unsightly materials shall be used for providing the secure measure and such measure shall be erected in a workmanlike manner. Before any construction commences on establishing the operation/storage area, Contractor shall take photographs and/or videos of the site in order to establish the original conditions of the site. A duplicate set shall be made and submitted to the Government for its files. Upon completion and prior to the final acceptance of the contract work, the Contractor shall restore the area to its original condition.

1.10 INSPECTION

1.10.1 Preliminary Inspection of Existing Conditions

A minimum of seven (7) calendar days prior to actual construction, the Contractor shall arrange to have the Contractor's Quality Control representative meet with the authorized Contracting Officer's representative to inspect the existing facilities, and all other pertinent items within the construction area. The inspection shall be conducted to establish the existing conditions of the facilities, so that it may subsequently be determined whether any damages to the facilities are the result of the construction activity.

1.10.2 Final Inspection and Acceptance

The Contractor shall give the Contracting Officer, a minimum of fourteen (14) calendar days advance notice prior to final inspection for acceptance by the Contracting Officer. All deficiencies found on final inspection shall be promptly and satisfactorily corrected by the Contractor upon notification by the Contracting Officer.

1.11 WORKING DIRECTIVES

All work shall be performed between the hours of 0730 to 1600 HST, Monday through Friday. No work shall be accomplished on Saturdays, Sundays, and all federal holidays without written permission from the Contracting Officer. Such written permission shall be available at the job site at all times during construction.

1.12 USE OF PRODUCTS CONTAINING RECOVERED MATERIALS

Recovered materials are materials manufactured from waste material and byproducts that have been recycled or diverted from solid waste. The Contractor shall give preference to products containing recovered material when price, performance, and availability meet project requirements. A listing of products, including the recommended recovered material content, is provided by the Environmental Protection Agency at http://www.epa.gov/cpg/products.htm. Only those products having recovered material content equal to or greater than EPA guidelines shall be used to meet this requirement.

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SECTION 02210

GRADING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 117	(1987) Materials Finer than 75 um (No.200) Sieve in mineral Aggregates by Washing
ASTM D 422	(1972) Particle Size Analysis of Soils
ASTM D 1556	(1982) Density of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1978) Moisture-Density Relations Of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in. (457-mm) Drop
ASTM D 2487	(1985) Classification of Soils for Engineering Purpose

1.2 DEFINITIONS

1.2.1 Satisfactory Materials

Materials classified in ASTM D 2487 as GW, GP, SW and SP, and free from roots and other organic matter, trash, debris, and stones larger than 3 inches in any dimension are satisfactory. Materials classified as GM and SM, containing no more than 15 percent passing the No. 200 sieve, are also satisfactory.

1.2.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Materials classified in ASTM D 2487 as GC, SC, MH, ML, CH, CL, PT, OH, and OL are unsatisfactory. Unsatisfactory materials also include man-made fills, refuse, or backfills from previous construction.

1.2.3 Degree of Compaction

Degree of compaction is a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557, Method D abbreviated below as a percent of laboratory maximum density.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL DESCRIPTIONS:

SD-08 Statements

Field Testing Control; FIO.

Qualifications of the commercial testing laboratory who will be performing all testing in accordance with paragraph FIELD TESTING CONTROL.

SD-09 Reports

Field Testing Control; FIO. Satisfactory Materials; FIO.

Certified test reports and analysis certifying that the satisfactory materials proposed for use at the project site conform to the specified requirements, and for all tests conducted in accordance with paragraph FIELD TESTING CONTROL.

PART 2 PRODUCTS

2.1 BORROW MATERIAL

Borrow material shall be selected to meet requirements and conditions of the particular fill for which it is to be used. Necessary clearing, grubbing, disposal of debris, and satisfactory drainage of borrow pits shall be performed by the Contractor as incidental operations to the borrow excavation.

2.1.1 Selection

Borrow materials shall be obtained from sources outside the limits of Government-controlled land. Borrow materials shall be subject to approval. The source of borrow material shall be the Contractor's responsibility.

PART 3 EXECUTION

3.1 EXCAVATION

Excavation of every description, regardless of material encountered, within the grading limits of the project shall be performed to the lines and grades indicated. Satisfactory excavation material shall be transported to and placed in fill areas within the limits of the work. All unsatisfactory material including any soil which is disturbed by the Contractor's operations or softened due to exposure to the elements and water and surplus material shall be removed from site. In the event that it is necessary to remove unsatisfactory material to a depth greater than specified, the Contracting Officer shall be notified and an adjustment in the contract price will be considered in accordance with the contract. Excavations carried below the depths indicated, without specific directions, shall, except as otherwise specified, be refilled to the proper grade with satisfactory material as directed. All additional work of this nature shall be at the Contractor's expense. Excavation and filling shall be performed in a manner and sequence that will provide drainage at all times. Material required for fills in excess of that produced by excavation within the grading limits shall be obtained from borrow areas.

3.2 BACKFILL ADJACENT TO STRUCTURES

Backfill adjacent to structures shall be placed and compacted uniformly in such manner as to prevent wedging action or eccentric loading upon or against the structures. Slopes bounding or within areas to be backfilled shall be stepped or serrated to prevent sliding of the fill. During backfilling operations and in the formation of embankments, equipment that will overload the structure in passing over and compacting these fills shall not be used.

3.3 PREPARATION OF GROUND SURFACE FOR FILL

All vegetation, such as roots, brush, heavy sods, heavy growth of grass, and all decayed vegetable matter, rubbish, and other unsatisfactory material within the area upon which fill is to be placed, shall be stripped or otherwise removed before the fill is started. In no case will unsatisfactory material remain in or under the fill area. Prepared surfaces on which compacted fill is to be placed shall be wetted or dried as May be required to obtain the specified moisture content and density.

3.4 FILLS AND EMBANKMENTS

Fills and embankments shall be constructed at the locations and to lines and grades indicated. The completed fill shall conform to the shape of the typical sections indicated or shall meet the requirements of the particular case. Satisfactory material obtained during excavation may be used in forming required fill. Fill shall be satisfactory material and shall be reasonably free from roots, other organic material, and trash and from stones having a maximum diameter greater than 3 inches. Fills below Elevation (+) 2.0 shall be placed in one lift to Elevation (+) 2.0, and the surface shall be compacted with six passes of approved compaction equipment to form a working platform. The remainder of the fill above Elevation (+) 2.0 shall be placed in horizontal layers not exceeding 8 inches in loose thickness for mechanized compaction equipment and not exceeding 6 inches in loose lifts for manual compaction equipment. Each layer shall be compacted as specified hereinafter before the overlaying lift is placed. Moisture content of the fill or backfill material shall be adjusted by wetting or aerating, as required.

3.5 COMPACTION

Each layer of the fill or embankment above elevation (+) 2.0 shall be compacted to at least 95 percent of laboratory maximum density.

3.6 FINISHED EXCAVATION, FILLS, AND EMBANKMENTS

All areas covered by the project, including excavated and filled sections and adjacent transition areas, shall be uniformly smooth-graded. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from blade-grader operations, except as otherwise specified.

3.7 FIELD TESTING CONTROL

Testing shall be the responsibility of the Contractor and shall be performed by an approved commercial testing laboratory or by the Contractor subject to approval. One gradation test per 200 cubic yards of fill and backfill material shall be performed in accordance with ASTM C 117 and ASTM

D 422. Field density and moisture content tests shall be performed on every 2,000 square feet of each lift placed. Field in-place density shall be determined in accordance with ASTM D 1556.

3.8 PROTECTION

Newly graded areas shall be protected from traffic and from erosion, and any settlement or washing away that may occur from any cause, prior to acceptance, shall be repaired and grades reestablished to the required elevations and slopes. All work shall be conducted in accordance with the environmental protection requirements of the contract.

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SECTION 02378

GEOTEXTILES USED AS FILTERS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 123	(1993a) Standard Terminology Relating to Textiles
ASTM D 1683	(1990a) Failure in Sewn Seams of Woven Fabrics
ASTM D 3786	(1987) Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics - Diaphragm Bursting Strength Tester Method
ASTM D 3884	(1992) Abrasion Resistance of Textile Fabrics (Rotary Platform, Double-Head Method)
ASTM D 4354	(1989) Sampling of Geosynthetic for Testing
ASTM D 4355	(1992) Deterioration of Geotextile from Exposure to Ultraviolet light and Water (Xenon-Arc Type Apparatus)
ASTM D 4491	(1992) Water Permeability of Geotextiles By Permittivity
ASTM D 4533	(1991) Trapezoid Tearing Strength of Geotextile
ASTM D 4632	(1991) Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(1993) Determining the Apparent Opening Size of a Geotextile
ASTM D 4833	(1988) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
ASTM D 4873	(1988) Guide for Identification, Storage, and Handling of Geotextiles
ASTM D 4884	(1990) Seam Strength of Sewn Geotextiles

1.2 SUBMITTALS

Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-13 Certificates

Geotextile; FIO.

The Contractor shall submit a certification of the geotextile material from the manufacturer.

SD-14 Samples

Geotextile; FIO.

If requested by the Contracting Officer, the Contractor shall provide to the Government geotextile samples for testing to determine compliance with any or all of the requirements in this specification. When samples are to be provided, they shall be submitted a minimum of 60 days prior to the beginning of installation of the same textile. A written certificate of compliance signed by a legally authorized official from the company shall be submitted, in duplicate, upon delivery of the geotextile. The certificate shall state that the geotextile shipped to the site meets the chemical requirements and exceeds the minimum average roll value listed in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE. Upon request, the contractor shall supply quality control and quality assurance tests for the geotextile. All samples provided shall be from the same production lot as will be supplied for the contract, and shall be the full manufactured width of the geotextile by at least 10 feet long, except that samples for seam strength may be a full width sample folded over and the edges stitched for a length of at least 5 feet. Samples submitted for testing shall be identified by manufacturers lot designation. For needle punched geotextile, the manufacturer shall certify that the geotextile has been inspected using permanent on-line metal detectors and does not contain any needles.

1.3 SHIPMENT, HANDLING, AND STORAGE

1.3.1 Shipment and Storage

Only approved geotextile shall be delivered to the project site. All geotextile shall be labeled, shipped, stored, and handled in accordance with ASTM D 4873. No hooks, tongs, or other sharp instruments shall be used for handling geotextile.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Geotextile

2.1.1.1 General

The geotextile shall be a woven or non-woven pervious sheet of plastic yarn as defined by ASTM D 123. The geotextile shall equal or exceed the minimum average roll values listed in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE. Strength values indicated in the table are for the

weaker principal direction.

TABLE 1
MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE

PROPERTY	UNITS	ACCEPTABLE VALUES FOR LESS THAN 50% ELONG ATION	TEST METHOD
GRAP STRENGTH	lb	310	ASTM D 4632
ABRASION	lb		ASTM D 3884
SEAM STRENGTH	lb	280	ASTM D 4632
PUNCTURE	lb	110	ASTM D 4833
BURST STRENGTH	psi	510	ASTM D 3786
TRAPEZOID TEAR	lb	110	ASTM D 4533
APPARENT OPENING SIZE	mm	0.22	ASTM D 4751
PERMITTIVITY	sec -1	0.1	ASTM D 4491
ULTRAVIOLET DEGRADATION	Percent	50 AT 500 Hrs	50 AT 500 Hrs	ASTM D 4355

2.1.1.2 Geotextile Fiber

Fibers used in the manufacturing of the geotextile shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of polyolefins, polyesters, or polamides. Stabilizers and/or inhibitors shall be added to the base polymer if necessary to make the filaments resistant to deterioration caused by ultraviolet light and heat exposure. Reclaimed or recycled fibers or polymer shall not be added to the formulation. Geotextile shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including the edges. The edges of the geotextile shall be finished to prevent the outer fiber from pulling away from the geotextile.

2.1.2 Seams

The seams of the geotextile shall be sewn with thread of a material meeting the chemical requirements given above for geotextile yarn. The sheets of geotextile shall be attached at the factory or another approved location, if necessary. Seams shall be tested in accordance with method ASTM D 1683. The strength of the seam shall be not less than 90 percent of the required grab tensile strength of the unaged geotextile in any principal direction.

2.1.3 Securing Pins

The geotextile shall be secured to the embankment or foundation soil by pins to prevent movement prior to placement of revetment materials. Other appropriate means to prevent movement such as staples, sand bags, and stone

could also be used. Securing pins shall be inserted through both strips of overlapped geotextile along the line passing through midpoints of the overlap. Securing pins shall be removed as placement of revetment materials are placed to prevent tearing of geotextile or enlarging holes maximum spacing between securing pins depends on the steepness of the embankment slope. The maximum pins spacing shall be equal to or less than the values listed in TABLE 2, MAXIMUM SPACING FOR SECURING PINS. When windy conditions prevail at the construction site, the number of pins should be increased upon the demand of the Contracting Officer. Terminal ends of the geotextile shall be anchored with key trench or apron at crest, toe of the slope and upstream and downstream limits of installation.

TABLE 2
MAXIMUM SPACING FOR SECURING PINS

EMBANKMENT	SPACING, feet
STEEPER THAN 1V ON 3H	2
1V ON 3H TO 1V ON 4H	3
FLATTER THAN 1V ON 4H	5

2.2 INSPECTIONS, VERIFICATIONS, AND TESTING

2.2.1 Manufacturing and Sampling

Geotextiles and factory seams shall meet the requirements specified in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE. Geotextiles shall be randomly sampled in accordance with ASTM D 4354 (Procedure Method A). Factory seams shall be sampled at the frequency specified in ASTM D 4884.

2.2.2 Site Verification and Testing

Samples shall be collected at approved locations upon delivery to the site in accordance with ASTM D 4354 (Procedure Method B). Samples shall be tested to verify that the geotextile meets the requirements specified in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE. Samples shall be identified by manufacturers name, type of geotextile, lot number, roll number, and machine direction. Testing shall be performed at an approved laboratory. Test results from the lot under review shall be submitted and approved prior to deployment of that lot of geotextile. Rolls which are sampled shall be immediately rewrapped in their protective covering.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Surface on which the geotextile will be placed shall be prepared, to a relatively smooth surface condition, in accordance with the applicable portion of this specification and shall be free from obstruction, debris, depressions, erosion feature, or vegetation. Any irregularities will be

removed so as to insure continuous, intimate contact of the geotextile with all the surface. Any loose material, soft or low density pockets of material, will be removed; erosion features such as rills, gullies etc. must be graded out of the surface before geotextile placement.

3.2 INSTALLATION OF THE GEOTEXTILE

3.2.1 General

The geotextile shall be placed in the manner and at the locations shown. At the time of installation, the geotextile shall be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage.

3.2.2 Placement

The geotextile shall be placed with the long dimension perpendicular to the shoreline and laid smooth and free of tension, stress, folds, wrinkles, or creases. The strips shall be placed to provide a minimum width of 36 inches of overlap for each joint. The placement procedure requires that the length of the geotextile be approximately 15 percent greater than the slope length. The Contractor shall adjust the actual length of the geotextile used based on initial installation experience. Temporary pinning of the geotextile to help hold it in place until the overlying material is placed shall be allowed. The temporary pins shall be removed as the bedding is placed to relieve high tensile stress which may occur during placement of material on the geotextile. Design protection of riprap should be in compliance with EM 1110-2-1601. Trimming shall be performed in such a manner that the geotextile shall not be damaged in any way.

3.3 PROTECTION

The geotextile shall be protected at all times during construction from contamination by surface runoff and any geotextile so contaminated shall be removed and replaced with uncontaminated geotextile. Any damage to the geotextile during its installation or during placement of overlying shall be replaced by the Contractor at no cost to the Government. The work shall be scheduled so that the covering of the geotextile with a layer of the specified material is accomplished within 1 calendar days after placement of the geotextile. Failure to comply shall require replacement of geotextile. The geotextile shall be protected from damage prior to and during the placement of riprap or other materials. This may be accomplished by limiting the height of drop to less than 1 foot, by placing a cushioning layer of sand or gravel on top of the geotextile before placing the material, or other methods deemed necessary. Care should be taken to ensure that the utilized cushioning materials shall not impede the flow of water. Before placement of riprap or other materials, the Contractor shall demonstrate that the placement technique will not cause damage to the geotextile. In no case shall any type of equipment be allowed on the unprotected geotextile.

3.4 PLACEMENT OF CUSHIONING MATERIAL

Placing of cushioning material shall be performed in a manner to insure intimate contact of the geotextile with the prepared surface and with the cushioning material. The placement shall also be performed in a manner that shall not damage the geotextile including tear, puncture, or abrasion. On sloping surfaces the cushioning material shall be placed from the bottom of the slopes upward. During placement, the height of the drop of

riprap material shall not be greater than 12 inches. Any geotextile damaged beneath the cushioning material shall be uncovered as necessary and replaced at no cost to the Government.

3.5 OVERLAPPING AND SEAMING

3.5.1 Overlapping

The overlap of geotextile rolls or panels shall be 36 inches. Appropriate measures will be taken to insure required overlap exists after cushion placement.

3.5.2 Sewn Seams

High strength thread should be used such that seam test should conform to ASTM D 1683. The thread shall meet the chemical, ultraviolet, and physical requirements of the geotextile, and the color shall be different from that of the geotextile. The seam strength shall be equal to the strength required for the fabric in the direction across the seam. Overlapping J-type seams are preferable over prayer-type seams as the overlapping fabric reduces the chance of openings to occur at the seam. Double sewing shall be used specially for field seams to provide a safety factor against undetected missed stitches.

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SECTION 04413

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SECTION 04413

STONE PROTECTION (SHORELINE REVETMENT)

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 33	(1992a) Concrete Aggregates
ASTM C 127	(1988) Specific Gravity and Absorption of Coarse Aggregate
ASTM C 144	(1993) Aggregate for Masonry Mortar
ASTM C 150	(1992) Portland Cement
ASTM D 75	(1987; R1992) Sampling Aggregate

1.2 SUBMITTALS

Government approval is required for submittals with "GA" designation; submittals having a "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330, SUBMITTAL DESCRIPTIONS:

SD-04 Drawings

Selection of borrow sources and detailed plans for quarry operations; GA.

SD-14 Samples

Stone; GA.

1.3 SOURCES OF STONE

Stone may be quarried or obtained from other sources as approved. All stones shall meet the requirements specified herein. Development of stone source and improvements of any access to the site shall be at the Contractor's responsibility and expense. The sources from which the Contractor proposes to obtain the material shall be selected well in advance of the time when the stones will be needed in the work. Approval of a source or sources of stone shall not be construed as approval of all material from that source or sources. The right is reserved to reject materials produced from localized areas, zones, or strata when such materials are unsuitable as determined by the Contracting Officer. Any suitable size stone salvaged or recovered from required excavation and meeting the specified requirements may be used in the work.

1.4 SAMPLING AND FIELD TESTING OF STONE

1.4.1 Sampling

Samples of stones from sources proposed by the Contractor shall be taken at locations designated by the Contracting Officer. The samples will be used as standards of the rock quality to be furnished by the Contractor. Duplicate sets of samples shall be taken, numbered, referenced and identified. One set shall remain at the Contractor's quarry (source) for later comparison with actual pieces of rock to be furnished for the project. The second set of samples shall be delivered, at the Contractor's expense, to laboratory meeting Government certification criteria at least 30 days in advance of the time when placing of stone is expected to begin. Sampling, identification, preparation and transportation of samples shall be in accordance with ASTM D 75. All tests and transportation costs shall be paid for b the Contractor.

1.4.2 Field Testing of Stones

Prior to removal from the source, the Contractor shall field test representative rock pieces selected by the Contracting Officer by dropping from a vertical height of ten feet on a solid rock surface or on a bed of comparable size rock proposed for the project. Broken, cracked, or otherwise damaged stones found by dropping will not be acceptable and shall be disposed of by the Contractor at his expense.

1.5 QUARRY AND BORROW OPERATIONS

1.5.1 Quarry and Borrow Areas

The Contractor shall be responsible for obtaining all rights-of-way required in connection with his borrowing and quarrying operations. The Contractor shall obtain from the owners the right to procure materials, pay all charges involved, and bear all expenses of developing the sources, including rights-of-way for hauling. Necessary plant, labor, and materials, for clearing, scraping, disposal, loading, hauling, and all other operations required to obtain the stones and borrow materials shall be provided by the Contractor at no additional cost to the Government. The Contractor shall, at his own expense, maintain all haul roads required for access from the quarry areas to the site of the work and provide additional haul roads as required. The Contractor shall maintain necessary warning signs, and place warning lights between sundown and sunup along roads subject to public traffic. The Contractor shall be responsible for trespassing upon or injury to private lands adjacent to rights-of-way resulting from his actions or those of his employees

1.5.2 Operation Requirement

The Contractor shall submit to the Contracting Officer, within 15 days after receipt of notice to proceed and 30 days before any work in the borrow and quarry areas, plans for the Contractor's borrow and quarry operations. Plans of operation shall include the following:

a. Selection of quarry-borrow sources.

b. Detailed plans for quarry operation including:

(1) Maps, descriptions, and plans of proposed road to quarry and borrow sources.

(2) Method(s) of excavation.

(3) Plans for drainage and restoration after completion of work.

All operations shall be subject to the approval of the Contracting Officer.

PART 2 PRODUCTS

2.1 STONE

2.1.1 General

All stones shall be dense, durable, and of a suitable quality to insure permanence in the structure and in the climate in which it is to be used. Stones shall be free from cracks, seams, and other defects that would tend to increase unduly its deterioration from natural causes.

2.1.2 Physical Requirements

Physical properties of the stones shall conform to the following requirements when tested in accordance with the respective ASTM Standards. Acceptance tests shall be performed on individual stone pieces 10 to 30 pounds in weight in lieu of the sizes specified in ASTM C 127. Test apparatus shall be improvised to accommodate the above stone sizes. All acceptance tests shall be made by and at the expense of the Government. Samples of stone shall be furnished as specified in paragraph SAMPLING AND FIELD TESTING OF STONE.

ASTM C 127	Bulk Specific Gravity (Saturated Surface Dry) Not less than 2.5.
ASTM C 127	Absorption - Not More than 4 percent.

2.2 CEMENT

Cement shall conform to ASTM C 150, Type II.

2.3 SAND FOR MORTAR

Sand shall conform to ASTM C 33, fine aggregate or to ASTM C 144.

PART 3 EXECUTION

3.1 EARTHWORK

Excavation and backfilling shall be as specified in Section 02210GRADING.

3.2 UNDERLAYER STONE

3.2.1 General

Underlayer stone shall be of the sizes shown on the drawings and shall conform to the requirements of paragraph STONE.

3.2.2 Placement

Underlayer stones shall be placed to the lines, grades, and thicknesses indicated. Underlayer stone shall be placed to its full layer thickness in one operation and in such a manner to avoid displacing the underlying

material. A tolerance of 3 inches will be permitted. The desired distribution of sizes of stones throughout the mass may be obtained by selective loading, controlled dumping of successive loads during placing or by a combination of these methods. Placing stones into chutes or by similar methods likely to cause segregation of the various sizes will not be permitted. Placement shall be accomplished without displacement to the underlying material. The placement of underlayer stone shall proceed as soon as practicable after placing the geotextile filter fabric to prevent wave action from displacing the geotextile filter fabric.

3.3 ARMOR STONE

3.3.1 General

Armor stones shall be of the sizes shown on the drawings and conform to the requirements of paragraph STONE.

3.3.2 Placement

3.3.2.1 Armor Stone (One-Stone Thick)

Armor Stone (One-stone thick) shall be placed within the limits and elevations indicated on the drawings to provide a one-stone thickness. Allowable tolerances for slope stones shall be 6 inches from the thickness shown. Crest stone tolerance of 6 inches from the elevations indicated is allowed. Stones shall be individually keyed and fitted in the structure such that each stone shall in be contact with all adjacent stones. Extremes in the indicated tolerances among adjacent stones is not permitted. The size of voids between all stones shall be kept to a minimum to prevent underlayer material from passing through the voids. Chinking of void spaces using smaller stones is not permitted. Stones shall be generally rectangular in cross section, the least dimension of any stone being not less than one-third its greatest dimension. Armor stones shall be placed on the prepared underlayer surfaces using equipment suitable for handling the sizes indicated without damage to the stones. Placement of the armor stones shall proceed as soon as practicable after the underlayer placement to prevent wave action from displacing the underlayer material.

3.4 CEMENT RUBBLE MASONRY (CRM)

3.4.1 Size

Individual stones other than spalls shall have a thickness of not less than 6 inches and a width of not less than 1-1/2 times the thickness or not less than 12 inches. Each stone shall have a length of not less than 1-1/2 times its width.

3.4.2 Mortar

Mortar shall consist of 1 part Portland cement, 3 parts sand (by volume of cement used), and water. The mortar shall be mixed in a mixer and sufficient water shall be added to produce a workable mix with a trowel. The mortar shall be used in the work within a period of 30 minutes after mixing. Retempering of mortar will not be permitted.

3.4.3 Foundation Preparation

Areas on which cement rubble masonry is to be placed shall be trimmed and dressed to conform to theoretical slope lines and grades indicated. The

bottom of cement rubble masonry shall be placed on an undisturbed subgrade.

3.4.4 Placement

Large, flat stones shall be selected and placed for the bottom course on the prepared base in such manner that adjacent stones are in close contact. Selected stones, roughly squared and pitched to lines shall be used at all angles and ends of walls. All stones shall be fully bedded in mortar and keyed in, with overlapping joints of at least 6 inches forming a firm bond. Spaces between the stones shall be filled solid with mortar. Spalls shall not be placed in nests in lieu of larger size stone. A tolerance of plus or minus 3 inches from the slope lines and grades shown on the drawings will be allowed in the finished surface provided either extreme of this tolerance is not continuous over an area greater than 200 square feet. Weep holes shall be provided as indicated on the drawings. After completion of an area, the surfaces shall be protected from rain, flowing water, and mechanical injury.

-- End of Section --

LAUNIUPOKO STATE SPECIFICATIONS

This attachment contains amendments to be used with the HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND PUBLIC WORKS CONSTRUCTION, 1994.

SECTION 507 - RAILINGS

Make the following amendments to said Section:

(I) Amend **507.03 Construction Requirements** by adding the following paragraph after the eleventh paragraph:

Type "I" Culvert Headwall Upgrade Work. As shown on the plans, perform the following work for the Type "I" Culvert Headwall Upgrade Work:
Construct the Type "I" Culvert Headwall Upgrade according to Section 503 - Concrete Structures and Section 501 - Steel Structures. Remove and dispose any soil and/or asphalt concrete needed to construct the concrete curb. Drill holes, furnish and place neat epoxy anchor rebar dowels and threaded rods. Furnish and place reinforcing steel and concrete for the concrete curb. Furnish and place 40 linear feet of asphalt concrete curb according to Section 609 - Curb and/or Gutter. Furnish and place all required structural steel, threaded rods, nuts and washers for the metal bike railing. Furnish and place all pavement markings destroyed or damaged during the construction of the Type "I" Culvert Headwall Upgrade. Furnish and place other items integral with the Type "I" Culvert Headwall Upgrade such as tube splices, roofing felt, concrete adhesive, etc. Store the material as needed and furnish all labor, material, equipment, tools, and other incidentals necessary to complete the Type "I" Culvert Headwall Upgrade work.

(II) Amend **507.04 Method of Measurement** to read as follows:

"The Engineer will measure Type "I" Culvert Headwall Upgrade per linear foot. The Engineer will make the measurement along the front face of the metal bike railing as shown on the plans."

(III) Amend **507.05 Payment** to read as follows:

The Engineer will pay for the accepted pay items listed below at the Contract unit price on a linear foot basis, as shown in the Proposal Schedule. Payment will be full compensation for the work prescribed in this Section and Subsection 109.02 - Scope of Payment.

The Engineer will pay for each of the following pay items when included in the Proposal Schedule:

Pay Item	**Pay Unit**
Type "I" Culvert Headwall Upgrade:	Linear Foot

END OF SECTION

Amend **Section 606 - Guardrail** to read as follows:

"**SECTION 606 - GUARDRAIL**

606.01 Description. This work includes installing guardrails according to the contract.

The contract designates the types of guardrails as follows:

(1) Type 1 (Unassigned)

(2) Type 2 Cable-Chain Link Barrier Guardrail

(3) Type 3 Beam Type Guardrail

(4) Type 4 Rigid Barrier Type Guardrail

The construction of guardrails includes the assembly and erection of component parts at the locations shown in the contract or as specified by the Engineer.

606.02 Materials. Materials shall conform to the following:

Joint Fillers	705.01
Reinforcing Steel	709.01
Wire Rope or Wire Cable	709.02
Chain Link Fencing	710.03
Metal Beam Rail	710.04
Guardrail Posts	710.07
Guardrail Hardware	710.08

Concrete for Type 4 Rigid Barrier Type Guardrail shall be Class A. Concrete for Type 4 Rigid Barrier Type Guardrail shall conform to Section 601 - Structural Concrete.

Furnish zinc-coated steel post and zinc-coated steel rail beam for the Type 3 Beam Type Guard Rail. Do not mix the type of steel posts within the project.

When the location of manufacturing plants allows, the Engineer may inspect the plants periodically for compliance with specified manufacturing methods. The

Engineer may get samples of materials for laboratory testing for compliance with material quality requirements. This may be the basis for acceptance of manufacturing lots regarding quality.

The condition of materials will be subject to inspection for acceptance before or during incorporation of materials into the work.

606.03 Construction Requirements. Repair zinc-coated base metal surfaces that the Contractor exposes, drills, threads, cuts according to 501.03(G)(2) - Repairing of Damaged Zinc-coated Surfaces.

Preserve and protect existing facilities that the Contractor may affect by the guardrail installation. Replace the guardrails that the Contractor damages due to its operation at no cost to the State.

(A) Beam Type Guard Rail.

(1) Posts. When using a suitable method, the Contractor may drive only steel posts, except those with anchors, into the ground. Maintain an accurate vertical alignment and shall not deform the steel post.

Set the wood and steel posts with anchors plumb in hand or mechanically dug holes. Backfill post holes with acceptable material placed in layers and compact thoroughly.

Set the posts vertically in the ground to the approximate depth shown in the contract. The posts, after backfilling or driving, shall be in accurate alignment with their tops at the required grade.

The Contractor may vary the guardrail post locations shown in the contract to ease clearing utility lines or to produce smooth transitions. Request such variance for acceptance by the Engineer. The Contractor may not vary the guardrail post locations of terminal sections.

When the contract requires additional bolts and holes on posts, drill the additional bolt holes and furnish the bolts for proper installation. Drill, furnish, and install this additional bolts at no cost to the State.

Do not make the additional bolt holes in posts by burning with a torch or other method or device. Manufacture or drill the holes in the posts.

Apply a preservation treatment to the wood posts and blocks according to Section 714 - Structural Timber and Related Materials.

Where field cutting or boring is done after treatment, thoroughly swab, spray, or brush the cuts and holes with two applications of preservatives accepted by the Engineer.

(2) Rail Elements. Install the rail elements that results in a smooth, continuous installation. Draw the bolts, except adjustment bolt, tight. Bolts shall be of sufficient length to extend beyond the nuts.

When the contract requires setting the guardrail posts at non-standard spacing, cut the rail elements and drill bolt holes as necessary for proper installation.

Do not make the additional bolt holes by burning with a torch or other method or device.

The Contractor does not require paint on zinc-coated steel railing.

(3) Existing Guardrail. The Contractor shall be responsible for verifying underground facilities such as utilities ducts, cables, and pipes in locations where the Contractor will drive guardrail posts. Repair damages done to the facilities despite the location or if shown in the contract at no cost to the State.

When removing the existing guardrails, backfill and compact the holes with suitable material. Grade and compact the shoulder area before installing the new guardrails and posts.

Reinstallation of guardrail shall be according to Subsection 606.03(A).

When replacing the existing guardrails with new guardrails and posts, do not leave an unprotected opening in the guardrail system of more than 500 linear feet. Also, after each work day, protect the areas not yet completed with physical barriers according to the latest MUTCD.

(4) Reset Guardrail Post. Adjust the height of existing guardrail post such that the guardrail element will be at the required height according to the contract.

Spacer blocks bolted to the existing post are to remain intact. When required or specified by the Engineer, excavate or fill and

compact around the post to be adjusted. Replace the guardrails that are damaged by the Contractor due to its operation at no cost to the State and according to the contract.

(B) Cable-Chain Link Barrier Guardrail.

(1) Post. Place the post at equal intervals. The Contractor may space the end post closer to adjacent posts, if specified by the Engineer. Set the posts vertical. Crown the concrete portion of the post footing at the top to shed water.

(2) Chain Link and Tension Cable or Top Rail. Fasten the chain link fabric to the tension cable, top tension wires or top rail, and posts with tie wires. Space the tie wires at approximately:

(a) 24 inch intervals to the tension cable, top tension wires or top rail and

(b) 15 inch intervals to the posts.

The tie wires shall start two inches from the top of the fabric with tie wires. Give the tie wire at least one complete twist.

Install the chain link fabric on the outer portion of the cables after clamping the cables in place and torque the u-bolts properly. The chain link fabric shall be on the "U" side of the cable clamps.

Stretch the tension wire tight with the turnbuckles. Install the turnbuckles at the beginning and end of each continuous section of chain link fabric and at such intermediate points as may be necessary for tightness.

Provide turnbuckles between 500 feet and 600 feet intervals for each tension cable.

Stagger the turnbuckle connections for tension cables so that the Contractor may locate not more than one turnbuckle in one panel. When a turnbuckle assembly falls at or within six inches of a post, clamp only the cable on the side of the post opposite the turnbuckle assembly to the post. At these locations, fasten the turnbuckle assembly or the cable on the turnbuckle side to the post with a No. 9 gage tie wire.

When connecting tension cables to pipe-type turnbuckles by factory swaged steel pulls, the complete turnbuckle assembly shall develop 100% of the breaking strength of the cable.

Furnish one test sample of cable to the Engineer for each 10,000 feet or less of cable the Contractor will install. The test sample shall be three feet in total length. Fit the test sample properly with right-hand thread swaged pulls at both ends as specified in the above paragraph.

When connecting the tension cables to drop forged steel closed sockets, the complete turnbuckle assembly shall develop 100% of the breaking strength of the cable. Fill the sockets with pure zinc.

Furnish one test sample of cable to the Engineer for each 10,000 feet or less of cable the Contractor will install. The test sample shall be three feet in total length. Fit the test sample properly socketed at both ends as specified in the above paragraph.

The Contractor may use preformed zinc-coated cable dead ends as an alternative method of connecting the tension cables to the turnbuckles at anchor blocks only. The installed dead ends shall develop 100% of the breaking strength of the cable.

At structures where constructing two barrier fences, bound or weld the exposed ends of the connecting tension cables.

Do not overtighten the tension cables. Position the tension cables firmly so that between 0.25 inch and 0.5 inch sag in the cables between posts occurs.

Place the u-bolts of the cable clamp assemblies across the lay of the tension cables. Tighten the nuts on the u-bolts by applying between 30 and 35 foot-pounds of torque.

When installing barrier on existing structures, anchor the posts to the deck shown in the contract.

Drill anchor bolt holes in the deck without spalling or damaging the concrete surrounding the hole. Set the anchor bolts with a mixture of commercial quality, modified epoxy adhesive and sand. The proportions of modified epoxy shall be between one adhesive to four sand and one adhesive to six sand. The Engineer will establish the exact proportions. The cementing agent includes two component mixture of modified epoxy adhesive manufactured especially for the making of epoxy-sand grouts. Mix two components according to the manufacturer's directions for use.

(C) Rigid Barrier Type Guardrail.

(1) Preparation. Shape and compact the foundation to a firm even surface according to the contract. Remove and replace soft and yielding material with acceptable material according to Section 305 - Aggregate Subbase Course.

(2) Forms. Forms shall be according to Section 503 - Concrete Structures.

(3) Placing Concrete. Moisten the foundation thoroughly immediately before placing the concrete. Concrete shall be cast-in-place. Place the concrete according to Section 503 - Concrete Structures.

On new and existing concrete bridge deck, dowel the barrier into the deck shown in the contract.

(4) Finishing. Finish the surface to a smooth, even surface according to Subsection 503.03(M)(2) - Class 2 Rubbed Finish.

(5) Joints. Construct expansion joint shown in the contract or at existing expansion joints of structures. Expansion joint filler shall be 0.5 inch thick.

Provide the construction joints with keys and at intervals shown in the contract.

(6) Transition Sections. At the end of the barrier, adjust or construct new and/or existing guardrail or chain link fence as specified by the Enigneer or shown in the contract.

606.04 Method of Measurement. The Engineer will not measure guardrail for payment.

606.05 Basis of Payment. The Engineer will pay for the accepted guardrail at the contract per lump sum bid price option B. The price includes full compensation for removing existing guardrails and posts; filling of post holes; grading and compacting the shoulder area; installing physical barrier; furnishing and installing the guardrails; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will pay for the accepted end anchorage, terminal section and transition section as lump sum bid price per option B. The price includes full compensation for removing existing guardrails and posts; filling of post holes; grading and compacting the shoulder area; installing physical barrier; furnishing and

installing the end anchorage, terminal section and transition section; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will pay for the accepted resetting guardrail post as lump sum bid price per option B. The price includes full compensation for adjusting guardrails at obstruction, guardrails with rubrail, thrie beams, transitions, end terminals, rubrail, guardrail elements, cable assemblies, footings, and posts; excavating; filling; compacting; grading; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

END OF SECTION

Amend **Section 621 - Traffic Control Signs** to read as follows:

"**SECTION 621 - TRAFFIC CONTROL SIGNS**

621.01 Description. This work includes furnishing and installing sign posts and foundations, reflector markers, object markers, signs, sign panels, route markers, construction signs, milepost markers, removing, storing, and installing sign panels, and sign supports; and incidental work necessary to complete the work.

621.02 Materials. Concrete for sign structures shall be of the class specified in the contract and shall conform to Section 601 - Structural Concrete. Other materials shall conform to the following:

Zinc Paints	708.02
Dark Green Enamel Paint	708.03
Paint Thinner	708.04
Signs	712.20
Reflector Marker	712.21
Flexible Delineator Post	712.51
Sign Posts	713.11
Fasteners for Signs	713.12

621.03 Construction Requirements.

(A) Destination and Expressway Sign Supports. Submit shop drawings for acceptance before assembling according to Section 501 - Steel Structures.

Welding shall be continuous and shall conform to Section 501 - Steel Structures.

The weld metal at transverse joints shall extend to the sleeve, making the sleeve an integral part of the joint. Make the longitudinal welds by the submerged arc process. Ground flush the welds except fillet welds with the base material.

Hot-dip zinc-coat the exposed surfaces including the inner portion of

the tubular posts and arms after fabrication. Hot-dip zinc-coat the upper 10 inches of anchor bolts. Zinc-coating shall be according to Section 501 - Steel Structures.

Paint the ground mounted destination sign supports at the work site after proper preparation of the zinc-coated surfaces according to Section 501 - Steel Structures. The exception is that painting shall include one prime coat of zinc-dust zinc-oxide primer followed by two coats of dark green enamel paint as specified.

The aluminum sign supports shall conform to Section 713.14(B) - Aluminum Supports.

(B) Miscellaneous Sign Supports. Install permanent signs on posts as specified in the contract. Set the posts plumb at the required locations.

(1) Sign Posts. The Contractor shall use flange channel posts or twelve (12) or fourteen (14) gauge square tube posts of the size specified in the plans for:

(a) Regulatory, warning, and construction signs,

(b) Bikeway signs,

(c) School area signs,

(d) Route marker assemblies,

(e) Civil Defense signs, or

(f) Conventional motorist services signs.

(2) Reflector Marker, Milepost Marker, And Type II Object Marker Posts. Reflector marker, milepost marker, and Type II object marker posts shall be either metal posts or flexible delineator posts as specified in the contract. Zinc-coat the metal posts. The metal post shall be 1.12 pounds per foot flanged channel posts or one and a half inch, 12 or 14 gauge square tube posts.

(3) Destination Sign Posts. Destination sign posts shall be zinc-coated steel posts, flanged channel posts, or 12 or 14 gauge square tube posts of the size specified in the contract.

(C) Destination And Expressway Signs. The Contractor shall be responsible for submitting shop drawings pertinent to the fabrication of destination and expressway signs.

Assemble and check the panels in the shop for straightness, alignment, and dimensions. Correct the variations according to the contract.

Install the sign panels carefully and securely according to the contract. Replace chipped or bent signs at no cost to the State.

(D) Reflector Marker. Make the reflector marker according to the dimensions and notes shown in the contract:

(1) Reflector markers RM-1, RM-2, and RM-3 shall be either:

(a) Type III or IV retroreflective sheeting markers,

(b) Glass sphere reflector markers with four inch by five inch reflector units, or

(c) Plastic prismatic reflector markers with three inch diameter reflector units.

(2) Reflector marker RM-4 shall be a Type III or IV retroreflective sheeting marker.

(3) Reflector marker RM-9 shall be either:

(a) Nine three inch round amber plastic prismatic reflectors fastened with blind rivets to a yellow Type III or IV retroreflective sheeting marker, or

(b) A yellow Type III or IV retroreflective sheeting marker of the dimensions shown in the contract.

(E) Type II Object Marker. Make Type II object markers according to the dimensions and notes shown in the contract. Reflective sheeting material shall conform to Subsection 712.20(C)(4) - Type III or IV Retroreflective Sheeting.

(F) Splicing of Sheet Reflecting Material. When using reflecting material as a background or signs with sheet aluminum backing, the Engineer will not allow splicing on legends. The reflecting material shall be of one piece whenever the sign dimensions are four feet by six feet or less.

(G) Removal of Existing Signs. Remove, clean, and store the existing regulatory, warning, expressway, destination and directional

signs and markers that the Contractor will not incorporate in the completed project at a location as ordered by the Engineer. The Engineer will decide which items are for disposal or storage.

(H) Shop Drawings for Refurbishing Each Sign Panel. Submit shop drawings for refurbishing each sign panel indicated on the plans for acceptance at least 10 working days before doing the work.

Complete each sign panel and in place within one working day. Exception to this requirement will be contingent upon safety considerations, equipment, and provisions for the protection of the public and with the acceptance of the Engineer.

(I) Labeling of Signs. Label the back of each new sign installed with the following information:

(1) Route Number,

(2) Mile Post (same as the existing sign), and

(3) Date (date the Contractor installs the sign).

The labeling shall be one inch high numbers using a black permanent felt-tipped marker.

(J) Construction Signs. Erect construction signs at the beginning of project and at the end of project at the location indicated by the Engineer. These signs shall remain for the duration of the highway project. Maintain these signs. Place these signs besides the required traffic control signs called for in Section 645 - Traffic Control.

The construction signs shall be new and become the property of the Contractor.

(K) Overlay Panels. Refurbish specific signs designated on the plans with overlay panels. The messages, shields, arrows, and borders shall conform to requirements set in the latest edition and amendments of the 'Manual on the Uniform Traffic Control Devices' (MUTCD), and as specified herein.

The overlay panels shall consist of aluminum sheets reflectorized according to Subsection 712.20. Reflectorize the messages, arrows, and border with Type III or IV retroreflective sheeting or acrylic plastic reflex reflectors. Reflectorize the shield symbol with Type III or IV retroreflective sheeting. The aluminum sheet shall conform to ASTM B 209, alloy

6061-T6 flat sheet, and shall be a minimum 0.100-inch thick.

Verify the sizes of sign panels affected and the sizes, shape and format of letters, numerals, symbols and borders before fabrication. Inform the Engineer immediately of discrepancies. Correct the discrepancies. Submit for acceptance the final design of the sign before fabrication.

Fabricate and install the overlay panels according to the manufacturer's instructions and as specified by the Engineer. Submit for acceptance splices before fabrication.

Remove existing letters, numerals, symbols and borders. Clean the existing sign panel before installation of the overlay. Clean and prepare the sign panel for overlaying as recommended by the panel manufacturer and as specified by the Engineer.

Installation of prefabricated overlay panels may be done with the existing sign panel remaining in place, subject to Engineer's acceptance of its methods. Engineer's acceptance will contingent upon safety, its traffic control provisions, provisions for the protection of the public and equipment. The Contractor shall be responsible for damages to public property including vehicles, as specified in Subsection 107.16 - Protection and Restoration of Property and Landscape, including all vehicles.

(L) Relocation of Existing Signs. Remove, clean, and fasten existing regulatory or warning signs to be relocated to new posts or supports according to the Standard Plans. Materials such as posts, nuts, bolts, washers, base support, brackets, and necessary hardware to install the existing sign shall be new. Submit the relocated sign location for acceptance.

621.04 Method of Measurement. The Engineer will measure the number of traffic control signs, reflectorized delineator, and route markers assemblies as complete units of the type and design specified in the contract.

The Engineer will not measure destination, and directional sign panels.

The Engineer will not measure removing and reusing existing ground mounted destination sign posts.

The Engineer will not measure relocating existing exit number sign panels to the right or left edge of expressway or destination signs.

The Engineer will not measure specific destination ('D' designation) or expressway ('E' designation) sign posts designated on the plans per each, complete in place.

No measurement is necessary for the overhead mounted destination sign ('D' destination) post and arm of posts and foundations when contracted on a lump sum basis.

The Engineer will not measure construction signs per each complete in place.

The Engineer will not measure the street name sign mounting assembly for payment.

The Engineer will not measure bi-directional mile post markers per each complete in place.

The Engineer will not measure for removal and delivery of existing signs and markers that will not be incorporated in the completed highway separately.

The Engineer will not measure for labeling of the new signs separately.

The Engineer will not measure the relocation of existing regulatory and warning signs per each complete in place. The Engineer will not measure the removal and salvaging or storing of existing post.

The Engineer will not measure for removing, cleaning, stacking, and delivering of existing signs, markers, and posts that will not be incorporated in the completed highway for payment.

The Engineer will not measure for replacement of existing sign panel with new destination sign panel per square foot of sign face.

The Engineer will not measure for removing, storing, and installing existing signs onto overhead sign structures when contracted on a lump sum basis.

The Engineer will not measure for overlay panels per square foot of sign face.

The Engineer will not measure for replacement of existing sign panel with new expressway sign panel per square foot of sign face.

The Engineer will not measure for replacement of existing sign panel with new destination and /or expressway sign panel per square foot of sign face.

621.05 Basis of Payment. The Engineer will pay for the accepted regulatory and warning signs, object markers and route markers assemblies at the contract unit price per each complete units of the type and design specified in the proposal. The price shall be full compensation for excavating and backfilling, furnishing and installing materials, furnishing equipment, tools, labors and incidentals necessary to complete the work.

The Engineer will pay for the accepted destination, directional, exit number sign panels and replacement of existing sign panels with new destination sign panels at the contract unit price per square foot for the type specified complete in place. The price shall be full compensation for furnishing and installing a complete sign panel, including enameling, cut-outs, post fasteners, sign framing, stiffeners, clamp assemblies, and necessary hardware, and furnishing equipment, tools, labors, materials and other incidentals necessary to complete the work.

The price includes full compensation for furnishing labors, materials, tools, equipment, necessary hardware, and incidentals necessary to complete the work

The Engineer will pay for the accepted destination sign posts designated on the plans at the contract unit price per each complete in place. The price shall be full compensation for furnishing and installing materials and furnishing equipment, tools, labors and incidentals necessary to complete the work.

The Engineer will pay for removing, storing, and installing existing signs onto overhead sign structure for on a lump sum basis for each structure complete in place. The price includes full compensation for furnishing materials, labors, tools, equipment, and incidentals necessary to complete the work.

The Engineer will pay for the accepted destination sign posts ('D' designation) at the contract unit price per each complete in place.

The Engineer will pay for the accepted overhead mounted destination sign posts ('D' designation), arm of posts, and foundations at a contract lump sum price on the type specified complete in place. The price shall be full compensation for furnishing and installing materials including anchor bases, brackets and necessary hardware, and furnishing labors, tools, equipment and incidentals necessary to complete the work.

The Engineer will pay for the accepted construction signs at the contract unit price per each, complete in place. The price includes full compensation for sign panels, posts, nuts, bolts, washers, base support, brackets and necessary hardware, labors, tools, equipment and incidentals necessary for the installation, maintenance, removal, cleaning, delivering, and storing of the signs with posts.

The Engineer will not pay for removal and delivery of existing signs and markers that will not be incorporated in the completed highway separately. The

Engineer will consider them incidental to the various contract items.

The Engineer will not pay for labeling of the new signs separately. The Engineer will consider them incidental to the various contract items.

The Engineer will pay for the accepted relocating of the existing regulatory and warning signs at the contract unit price per each complete in place. The price includes full compensation for cleaning the existing sign, providing new posts, nuts, bolts, washers, base support, brackets, necessary hardware, and furnishing labors, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for removing, cleaning, stacking, and delivering the existing signs, markers, and posts that are not incorporated in the completed project separately. The Engineer will consider them incidental to the various contract items.

The Engineer will make payment per lump sum under option B in the contract.

END OF SECTION

Amend **Section 629 - Pavement Markings** to read as follows:

"**SECTION 629 - PAVEMENT MARKINGS**

629.01 Description. This work includes installing and removing pavement markings according to the contract.

629.02 Materials. Materials shall conform to the following requirements:

White and Yellow Traffic Paint	708.06
Pavement Markers	712.40
Adhesives for Pavement Markers	712.41
Preformed Pavement Marking Tape	712.53
Reflective Thermoplastic Compound Pavement Markings	712.55

Materials installed shall be new, best of their respective grades and as specified below.

629.03 Construction Requirements.

(A) General. Pavement markings shall conform to the latest edition of:

(1) FHWA publication, "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD), and

(2) Traffic Standard Manual for City and County of Honolulu or governing counties.

Apply the pavement markings according to the contract. Pavement markings shall be clean cut, uniform, and neat. Correct the pavement markings according to the contract and at no cost to the State that:

(1) fail the requirements specified or

(2) the traffic damages or

(3) other causes.

Establish control points throughout the project for the layout of pavement markings. Do the layout and the Engineer will accept the layout before installing the work.

Longitudinal pavement markings shall not deviate more than one inch from the intended alignment on tangents and curves with radii greater than 5,000 feet. On curves with radii of 5,000 feet or less, the longitudinal pavement markings shall not deviate more than two inches from the intended alignment. Immediately correct misalignments when specified by the Engineer. Remove and reinstall the misaligned portion(s) plus an additional 25 feet segment from each end according to the contract.

Before applying the pavement markings, the surface shall be free of moisture and foreign or other material that may adversely affect bonding. Thoroughly blast clean the existing surfaces. Clean, newly placed surfaces need not be blast clean. Clean a prepared surface that becomes contaminated with moisture, dust, or other foreign matter before installing the pavement markings.

The Contractor may place pavement marking tape and pavement markers installed with bituminous adhesive immediately after completion of asphalt concrete pavement or within 14 days hence. Apply other pavement markings between 7 days and 14 days after completion of the pavement.

(B) Temporary Pavement Markings. Immediately install temporary pavement markings according to Table 629-I when:

(1) the Contractor does not install permanent pavement markings after completion of each day's final paving;

(2) the Contractor needs to open the roadway to public traffic for guidance through the area and as ordered by the Engineer; or

(3) the Engineer needs the temporary pavement markings for special traffic patterns.

Install ~~flexible delineator posts with Reflector Markers or Type I Barricades spaced at 80-foot intervals or~~ temporary solid four inch pavement marking tapes on the edge of the travelway for newly paved surfaces, scarified, or cold planed surfaces, reconstructed areas, and unmarked areas for guidance of motorists.

Maintain and replace temporary pavement markings~~, flexible delineators and barricades and as~~ specified by the Engineer.

Remove temporary markings before installing permanent pavement markings.

Permanently installed PASS WITH CARE, DO NOT PASS, NO PASSING ZONE, or other signs designated by the Engineer are to be covered or temporarily removed unless they are in agreement with the temporary striping.

When failing to install pavement markings according to the contract herein immediately after completion of the construction operations for each day, the Engineer will suspend the work and progress payment according to Subsection 105.01 - Authority of the Engineer.

TABLE 629-I TEMPORARY PAVEMENT MARKINGS

TYPE	PAVEMENT MARKINGS
Passing Permitted - Both Sides	Single 4-inch yellow stripe 5 feet in length spaced 20 feet on centers with Type D markers spaced 40 feet on centers and located on the center of the 5 foot length of stripe.
Passing Prohibited - Both Sides	Double solid 4-inch yellows stripe with Type D markers placed 20 feet on centers on one of the 4-inch yellow stripes selected by the Engineer.
Passing Permitted - One Side Only	Single continuous 4-inch yellow stripe with Type D markers placed on the stripe 20 feet on centers on the no-passing side and single 4-inch yellow stripes 5 feet in length spaced 20 feet on centers on the passing side.
Lane Lines - Lane Changing Permitted	Single 4-inch yellow or white stripe 5 feet in length spaced 20 feet on centers with Type C or Type D markers spaced 40 feet on centers
Lane Lines - Lane Changing Prohibited	Double solid 4-inch white stripes with Type C markers placed 20 feet on centers on one of the 4-inch white stripes selected by the Engineer.
Crosswalk	Two 4-inch white traverse lines spaced 8 feet on centers or as specified by the Engineer.
Stop Line	Single 4-inch white traverse line.

Notes:

a. The Contractor may use paint for temporary markings in areas where the Contractor has not completed final paving.

b. The temporary striping schedule shall be designated by the

Engineer.

(C) Permanent Pavement Markings

(1) Pavement Markers. Pavement Markers shall be:

(a) of uniform composition,

(b) free from surface irregularities and

(c) free from other physical damage or defects that affect appearance and/or performance.

The shape, dimensions, tolerances, types, uses, and layout shall be according to the contract.

Submit samples of the pavement markers and bituminous adhesives and/or epoxy adhesives to the Engineer for testing and acceptance before 10 days before usage. Sampling and testing of the pavement markers shall be according to Subsection 712.40.

Use Bituminous Adhesive for Pavement Markers according to Subsection 712.41 to cement markers to the pavement. When accepted by the Engineer, the Contractor may use Standard Set epoxy adhesive according to Subsection 712.41 at no additional cost to the State.

Heat and dispense the bituminous adhesive from an acceptable equipment that can maintain the required temperature. Placement of markers using bituminous adhesive shall be similar to placement of markers using epoxy adhesive.

When using epoxy adhesive, mix the components by a two-component type automatic mixing and extruding apparatus for use on the project. Automatic mixing equipment shall use positive displacement pumps and shall properly meter the components in the ratio of one to one ± 5% by volume. Check the ratio in the presence of the Engineer at the beginning of each day or as ordered.

The Contractor may mix only Standard Set Type adhesive manually and shall not mix more than one quart by volume.

When using two component adhesives, carry out the work quickly and efficiently due to the short pot life of the adhesive. Place the pavement markers within 60 seconds after mixing and extruding the adhesive. The Engineer will not allow further movement of the marker. Use up each mixed batch of adhesive within five minutes completely after the start of mixing. Place the adhesive on the pavement surface or on the bottom of the marker in complete coverage of the area of contact, without voids and with a uniform and adequate thickness to produce a slight excess after pressing the marker in place. Place the marker in position and apply pressure with a slight twisting motion until making firm contact with the pavement. If the Contractor cannot extrude the adhesive from under the marker applying pressure, discard the remaining batch of adhesive. Immediately remove the excess adhesive:

(a) around the edge of the marker,

(b) on the pavement, and

(c) on the exposed surfaces of the markers.

The Contractor may use soft rags moisten with mineral spirits conforming to Federal Specification TT-T-291 or kerosene to remove adhesive from the exposed faces of the markers. Do not use other solvents.

Protect the pavement markers against impact until the adhesive has hardened sufficiently. The Contractor may use the following table as a guide for the determination of sufficient hardening:

Temperature* (^{O}F)	Standard Set Type (Hours)	Rapid Set Type (Minutes)
100	1.5	15
90	2	20
80	3	25
70	4	30

60	5	35
50	7	45
40	No application below 50^{O} F	65
30		85
20		No application below 30^{O} F.
10		
*The temperature is either pavement surfaces or air temperature whichever is lower.		

Do not use the hardness of the rim of epoxy around the marker as an indication of the degree of cure.

Immediately reset the pavement markers implanted with improperly mixed adhesives requiring unusually long curing time as specified by the Engineer.

Do not install pavement markers when:

(a) the relative humidity is greater than 80% or

(b) the pavement surface is not dry.

Install the pavement markers according to contract as specified by the Engineer. When using Types A and J pavement markers for delineating 10-foot lane stripes, install them in sets of four with no fractional sets allowed. The Contractor may adjust the lengths of each 10-foot stripe and each 30-foot gap for skip striping ± one foot to present a uniform and balanced arrangement.

Do not install the pavement markers over longitudinal or transverse joints of the pavement surface, pavement marking tape, and thermoplastic extrusion markings.

(2) Traffic Paint. Use a wheeled applicator machine that is manually or machine propelled to apply at a nominal thickness of 0.015 inch or at a rate of 300 linear feet of single four inch stripe for one gallon paint. The applicator shall have appropriate shields around the nozzles to permit sharp stripe definition. The applicator shall have a separate nozzle

to direct an air stream immediately ahead of paint application for clearing away debris, dust and other foreign matter. Immediately remove misted, dripped and spattered paint on pavements as specified by the Engineer.

The Contractor may manually paint pavement arrows, symbols, words, and curb markings upon acceptance by the Engineer.

Protect freshly painted pavement markings from traffic until the paint is sufficiently dry and will not transfer to tires or other devices. The Contractor may use cones or other acceptable traffic control devices for this purpose.

Repair or correct pavement markings damaged by traffic and paint marks on the pavement caused by traffic crossing wet paint according to Subsection 629.03(D).

(3) Thermoplastic Extrusion Pavement Marking.

(a) Equipment. Apply the material to the pavement by an extrusion method. One side of the shaping die is the pavement and the other three sides are part of the equipment.

The equipment shall provide continuous mixing and agitation of the material. Construct conveying parts of the equipment to prevent accumulation and clogging. Parts of the equipment that come in contact with the material shall easily be accessible and exposable for cleaning and maintenance.

Mixing and conveying parts, including the shaping die, shall maintain the material at the plastic temperature.

The equipment shall assure continuous uniformity in the dimensions of the stripe.

The applicator shall cleanly cut off square stripe ends and apply "skip" lines. The Engineer will not permit the use of pans, aprons or similar appliances that the die overruns.

Apply beads to the surface of the completed stripe over the entire surface of the stripe and by an automatic bead dispenser attached to the liner.

Equip the bead dispenser with an automatic cutoff control synchronized with the cutoff of the thermoplastic material.

Construct the equipment to provide for varying die widths to produce varying widths of traffic markings.

Provide a special kettle for melting and heating the composition. Equip the kettle with an automatic thermoplastic control device so that the Contractor can do the heating by controlled heat transfer liquid than direct flame.

Equip and arrange the applicator and the kettle according to the Nation Fire Underwriters requirements.

The applicator shall be mobile and maneuverable so that the Contractor can follow straight lines and make normal curves in a true arc.

The applicator shall contain a minimum of 125 pounds of molten material.

(b) Application. Clean off dirt, blaze, paint, tape and grease and ordered by the Engineer.

The Contractor may apply the material in variable widths from two inches to twelve inches. Apply the material for the full width of stripe in one application or pass. For example, form an 8 inch stripe with an 8 inch die.

On concrete pavements and pavements containing less than 6% bituminous asphalt, pre-stripe the application area with a binder material, primer or prime seal coat recommended by the manufacturer.

The minimum installed thickness of the line as viewed from a lateral cross section shall be:

(a) not less than three thirty-secondth inch at the edges, and

(b) not less than one-eighth inch in the center.

Take the measurements as an average throughout 36 inch sections of the line. Two thousand pounds of thermoplastic materials supplied in granular or block form will yield approximately 6,600 feet of four inch striping with a 90-mil thickness.

The new line, when applied over an old line of compatible material, shall bond itself to the old line so that no splitting or separation takes place during its useful life.

The finished lines shall have well defined edges and be free of waviness.

(4) Preformed Pavement Marking Tape. The Contractor may apply the preformed pavement marking tape manually or with the tape applicators acceptable by the tape manufacturer. Apply the markings according to the tape manufacturer's recommendations and according to the contract.

Install either temporary or permanent preformed pavement marking tape according to the contract or specified by the Engineer.

Do not apply the preformed pavement marking tape over other markings. Remove the old markings and prepare the surface for tape application according to Subsection 629.03(A).

The minimum temperatures for the applications of preformed pavement marking tape shall be 60 ^{O}F. for air and 70 ^{O}F. for roadway surfaces, with both temperatures rising. The maximum temperature shall be 150 ^{O}F. for surfaces.

Before applying the permanent preformed pavement marking tape, prime the existing roadway surfaces with an acceptable primer as recommended by the tape manufacturer and ordered by the Engineer.

Apply the primer in one thin coat extending at least one inch beyond the tape edges. Allow the primer to dry until the primer feels tacky and will not lift or string.

The Contractor may use tapes of different widths to form a specified stripe width. For example, the Contractor may use two four-inch wide tapes to form an 8-inch wide stripe). The Engineer will make payment for the specified stripe width according to the contract.

Use butt splices only and shall not overlap the tape material.

Tamp the markings thoroughly with an acceptable mechanical tampers. Also, slowly drive a truck on the newly applied markings several times.

Areas marked with preformed pavement marking tape shall be ready for traffic immediately after application.

(D) Removal of Existing Pavement Markings. Remove the existing pavement markings according to the contract and as specified by the Engineer. Resolve the conflicts between existing and new markings by removing the existing as specified by the Engineer and according to the following:

(1) remove the existing pavement markings before applying the traffic paint, thermoplastic extrusion or preformed pavement marking tape;

(2) remove the existing markings so that the Contractor can make a smooth transition between existing and new markings; and

(3) remove the unnecessary markings before making changes in the traffic pattern.

Use removal methods that will cause the least possible damage to the pavement and its surface. Do not cause impressions of old markings to remain after the removal operations. Repair the damage to the pavement or its surface caused by removal operations including impressions of old markings at no cost to the State. Make the reparations as specified and accepted by the Engineer.

The Engineer will not permit eradication of existing markings by painting over them. The Engineer will permit burning off existing paint markings provided the Contractor uses an acceptable method using excess oxygen. Do not burn nor ground off the preformed pavement marking tape.

Remove the preformed pavement marking tape and thermoplastic extrusion markings by methods recommended by the manufacturer and acceptable by the Engineer.

The Engineer will permit sandblasting for paint removal. Remove the sand or other material deposited on the pavement due to removal operations as work progresses. The Engineer will not permit accumulation.

Immediately remove excess sand or other material deemed hazardous to traffic when specified by the Engineer.

629.04 Method of Measurement. The Engineer will not measure for furnishing and installing pavement striping, pavement markers, detour pavement striping, curb markings, temporary pavement markings, flexible delineators posts with reflector markers, Type I Barricades, and temporary signs and removing pavement markings for payment.

The Engineer will not measure the pavement arrow, pavement word, and pavement symbol per each.

629.05 Basis of Payment. The Engineer will pay for the accepted pavement striping at the contract lump sum price complete in place. The price includes full compensation for establishing control points, laying out, cleaning the existing surface, furnishing and applying the pavement stripings, and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay for the accepted detour pavement striping on a contract lump sum basis. The price includes full compensation for establishing control points, laying out, cleaning the existing surface, furnishing and applying the detour pavement striping, and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay for the accepted pavement arrow, pavement word, and pavement symbol at the contract unit price per each. The price includes full compensation for establishing control points; laying out; cleaning the existing surface; furnishing and applying the pavement arrow, pavement word, and pavement symbol; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay for the pavement markers including adhesives at the contract lump sum price. The price includes full compensation for submitting samples; applying adhesives; furnishing, installing, and protecting the pavement

markers; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will not pay for the accepted temporary pavement markings, flexible delineators posts with reflector markers, Type I Barricades, and temporary signs. The Engineer will consider the price for them included in the bid price of the various contract items. The price includes full compensation for maintaining, replacing, and eventually removing the temporary pavement markings, flexible delineators and barricades; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay for the accepted curb markings at the contract lump sum price. The price includes full compensation for establishing control points; laying out; cleaning the existing surface; furnishing and applying the curb markings; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay for the accepted removal of existing pavement markings at the contract lump sum price. The price includes full compensation for removing the existing pavement markings; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will pay under lump sum payment per option B of the contract.

END OF SECTION

SECTION 645 - TRAFFIC CONTROL DEVICES

Make the following amendments to said Section:

(I) Amend the title to read as "**SECTION 645 - WORK ZONE TRAFFIC CONTROL**"

(II) Amend **Table 645-I - For Traffic Control Plan** to read as follows:

TABLE 645-I - FOR TRAFFIC CONTROL PLAN

POSTED SPEED LIMIT (M.P.H.)	SIGN SPACING (D) (FEET)	TAPER LENGTH (T) (FEET)		LONGI-TUDINAL BUFFER SPACE (B) (FEET)	SPACING OF CONES OR DELINEATORS (FEET)		
		W = 12' OR LESS *	W = GREATER THAN 12' *		TAPER	TANGENT	WORK AREA
20	250	200	W x 17	35	20	20	10
25	250	200	W x 17	55	25	25	10
30	250	250	W x 20	85	30	30	10
35	250	250	W x 20	120	35	35	10
40	500	350	W x 30	170	40	40	10
45	500	550	W x 45	220	45	45	10
50	1000	600	W x 50	280	50	50	10
55	1000	700	W x 55	335	55	55	10

* W = width of lane or shoulder

(III) Amend **645.03 Construction Requirements** by adding the following:

Τραφφιχ χοντρολ δεϖιχεσ ινχλυδινγ χονεσ, βαρριχαδεσ, ωαρνινγ σιγνσ ωιτη συππορτσ, λιγητσ, ανδ τεμποραρψ σιγναλσ σηαλλ χονφορμ το Τηε Ηαωαιι Αδμινιστρατιϖε Ρυλεσ, Τιτλε 19, Συβτιτλε 5, Χηαπτερσ 127, 128 ανδ 129ə, τηε ΜΥΤΧΔ ανδ Σεχτιον 104 – Σχοπε οφ Ωορκ. Ρεφλεχτοριζατιον φορ προτεχτιϖε δεϖιχεσ συχη ασ χονεσ, βαρριχαδεσ, δελινεατορσ, ανδ σιγνσ, σηαλλ χονφορμ το Συβσεχτιον 712.20 – Σιγνσ.

Δο νοτ υσε στεελ δρυμσ ανδ στεελ βαρρελσ φορ τραφφιχ χοντρολσ ιν χονστρυχτιον ανδ μαιντενανχε ωορκ ζονεσ.

Ασ οφ 10/01/2000, αλλ νεω βαρριχαδεσ, σιγνσ ωιτη σιγν συππορτσ ανδ ϖερτι χαλ πανελσ ωιτηουτ λιγητσ σηαλλ ρεθυιρε αν ΦΗΩΑ αππροϖαλ λεττερ χερτιφψινγ τ ηατ τηε δεϖιχε ισ ΝΧΗΡΠ Ρεπορτ 350 χομπλιαντ. Δο νοτ υσε βαρριχαδεσ, σιγνσ ω ιτη σιγν συππορτσ, ανδ οτηερ τραφφιχ χοντρολ δεϖιχεσ πυρχηασεδ βεφορε 10/01/20 00 τηατ αρε νοτ χερτιφιεδ το βε ΝΧΗΡΠ Ρεπορτ 350 χομπλιαντ αφτερ 10/01/2003.

Υπον ρεθυεστ οφ τηε Ενγινεερ, φυρνιση α σελφ–χερτιφιεδ ΝΧΗΡΠ Ρεπορτ 350 χομπλιαντ λεττερ φρομ τηε ϖενδορ φορ εαχη τψπε οφ σινγλε–πιεχε τραφφιχ χονε, σι νγλε–πιεχε δρυμ, τυβυλαρ μαρκερ ανδ δελινεατορ.

(A) Signs

(1) General. Install signs ahead of the place where operations may interfere with the use of the road by traffic and at intermediate points where the new work crosses or coincides with an existing road.

Place such signs as specified by the contract and as specified and accepted by the Engineer.

Submit to the Engineer 8 sets of FHWA approval letter certifying that the signs and sign supports are NCHRP Report 350 compliant.

(B) Barricades

(1) General. Αππλψ ανδ ινσταλλ τηε βαρριχαδεσ αχχορδινγ το τ ηε χοντραχτ.

Προϖιδε, ερεχτ, ανδ μαινταιν νεχεσσαρψ βαρριχαδεσ, συιτα βλε ανδ συφφιχιεντ λιγητινγ δεϖιχεσ, σιγνσ ανδ οτηερ τραφφιχ χοντρο λ δεϖιχεσ, ανδ πρεχαυτιονσ φορ τηε προτεχτιον οφ τηε ωορκ ανδ σαφε τψ οφ τηε πυβλιχ

Προτεχτ ροαδωαψσ χλοσεδ το τραφφιχ, ιλλυμινατε οβστρυχτιο νσ δυρινγ ηουρσ οφ δαρκνεσσ, ανδ προϖιδε ωαρνινγ σιγνσ το χοντρο λ ανδ διρεχτ τραφφιχ αχχορδινγ το τηε χοντραχτ.

Submit to the Engineer 8 sets of FHWA approval letter certifying that the barricades are NCHRP Report 350 compliant.

Βαρριχαδεσ σηαλλ βε ιν γοοδ χονδιτιον. Συβμιτ βαρριχαδεσ φορ αχχεπτανχε βψ τηε Ενγινεερ φορ υσε ωιτηιν τηε προφεχτ λιμιτσ αχχορδινγ το τηισ σεχτιον. Βαρριχαδε αππλιχατιον ανδ ινσταλλατιον σηαλλ βε αχχορδινγ το τηε χοντραχτ ανδ ασ σπεχιφιεδ βψ τηε Ενγινεερ.

Προωιδε σανδ βαγσ ιφ ρεθυιρεδ ορ σπεχιφιεδ βψ τηε Ενγινεερ. Αλλ σανδ βαγσ ανδ τηειρ μετηοδ οφ ινσταλλατιον σηαλλ χομπλψ ωιτη τηε ΜΥΤΧΔ ανδ βε αχχεπτεδ βψ τηε Ενγινεερ πριορ το υσε. Δο νοτ πλαχε σανδ βαγσ ον τηε στριπεδ βαρριχαδε ραιλ.

Ινσταλλ στεαδψ βυρν ανδ/ορ φλασηινγ λαμπσ ον σελεχτεδ βαρριχαδεσ υσεδ δυρινγ ηουρσ οφ δαρκνεσσ. Λοχατιονσ σηαλλ βε αχχορδινγ το τηε χοντραχτ ανδ σπεχιφιεδ βψ τηε Ενγινεερ. Ατταχη τηε λαμπσ ον τηε βαρριχαδε ενδσ χλοσεστ το τηε τραωελεδ ωαψ. Λαμπσ σηαλλ βε ωισιβλε το τηε μοτοριστ.

Δο νοτ ινσταλλ σιγνσ ον βαρριχαδεσ υνλεσσ τηε σιγν ον βαρριχαδε σψστεμ ηασ βεεν χραση τεστεδ, αχχεπτεδ υνδερ ΝΧΗΡΠ Ρεπορτ 350, ανδ αχχεπτεδ βψ τηε Ενγινεερ.

Τηε Χοντραχτορ μαψ υσε τηε αχχεπτεδ βαρριχαδεσ φορ τεμποραρψ δετουρσ, χονστρυχτιον πηασινγ, ορ οτηερ τεμποραρψ τραφφιχ χοντρολ ωορκ.

Τηε Χοντραχτορ μαψ υσε τηε αχχεπτεδ βαρριχαδεσ υσεδ ιν τεμποραρψ δετουρσ ορ χονστρυχτιον πηασινγ φορ περμανεντ λοχατιονσ αχχορδινγ το τηε χοντραχτ.

Υπον χομπλετιον οφ τηε χονστρυχτιον ωορκ, λεαωε τηε βαρριχαδεσ ιν πλαχε, ρελοχατε τηε βαρριχαδεσ, ορ ρεμοωε ανδ δισποσε τηε βαρριχαδεσ αχχορδινγ το τηε χοντραχτ ορ ασ σπεχιφιεδ βψ τηε Ενγινεερ. Βαρριχαδεσ λεφτ ιν πλαχε ορ ρελοχατεδ το νεω περμανεντ λοχατιονσ σηαλλ βεχομε τηε προπερτψ οφ τηε Στατε. Βαρριχαδεσ ρεμοωεδ ανδ δισποσεδ οφ σηαλλ βεχομε τηε προπερτψ οφ τηε Χοντραχτορ.

(2)

Reflectorization. Ρεφλεχτοριζε βαρριχαδε ραιλσ ανδ τηε αττααχηεμεντ ωιτη ρεφλεχτιωε σηεετινγ αχχορδινγ το Συβσεχτιον 712.20(Χ)(4) – Τψπε ΙΙΙ ορ Ις Ρετρορεφλεχτιωε Σηεετινγ (Ηιγη ορ σπεχιφιεδ ανδ αχχεπτεδ βψ τηε Ενγινεερ.

Ρεφλεχτοριζε βοτη ωερτιχαλ φαχεσ οφ εαχη βαρριχαδε ραιλ αχ

χορδινγ το τηε χοντραχτ.

(3)

Color. Ραιλσ, φραμεσ ανδ βραχεσ σηαλλ βε ωηιτε. Τηε φρ οντ ανδ βαχκ φαχεσ οφ βαρριχαδε ραιλσ σηαλλ ηαϖε 6 ινχη ωιδε αλτε ρνατε χολορεδ ανδ ωηιτε στριπεσ σλοπινγ δοωνωαρδ τοωαρδ τηε τραϖ ελεδ ωαψ ατ αν ανγλε οφ 45 ^{O} ωιτη τηε ϖερτιχαλ. Τηε χολορεδ στριπ εσ σηαλλ βε ειτηερ ορανγε ορ ρεδ αχχορδινγ το τηε φολλοωινγ ρεθυιρε μεντσ:

(a)

Υσε ορανγε ανδ ωηιτε στριπεσ φορ χονστρυχτιον, δετου ρ ορ μαιντενανχε ωορκ.

(b)

Υσε ρεδ ανδ ωηιτε στριπεσ ον ροαδωαψσ ωιτη νο ουτλετ συχη ασ δεαδ–ενδσ ανδ χυλ–δε– σαχσ, ραμπσ ορ λανεσ χλοσε δ φορ οπερατιοναλ πυρποσεσ, ορ περμανεντ ορ σεμι–περμανεντ χλοσυρε ορ τερμινατιον οφ α ροαδωαψ.

(4)

Maintenance. Κεεπ τηε βαρριχαδεσ ιν γοοδ χονδιτιον τηρουγ ηουτ τηειρ υσαγε δυρινγ χονστρυχτιον.

(a)

Το μαινταιν τηειρ εφφεχτιϖενεσσ ανδ αππεαρανχε, ρεπα ιρ, χλεαν ορ ρεπλαχε τηε ρεθυιρεδ βαρριχαδεσ ασ σπεχιφιεδ βψ τηε μανυφαχτυρερ γυιδελινεσ ανδ ασ σπεχιφιεδ βψ τηε Ενγινεε ρ.

(b)

Ιμμεδιατελψ ρεπλαχε λοστ, στολεν ορ δαμαγεδ βαρριχα δεσ, λαμπσ ανδ σανδ βαγσ.

Χλεαν ανδ ρεπαιρ τηε βαρριχαδεσ υσεδ δυρινγ χονστρυχτιον π ηασινγ, τεμποραρψ δετουρσ ορ οτηερ τεμποραρψ τραφφιχ χοντρολ ωο ρκ βεφορε ρελοχατινγ το περμανεντ λοχατιονσ αχχορδινγ το τηε χοντρ αχτ ορ ασ σπεχιφιεδ βψ τηε Ενγινεερ.

Τηε Ενγινεερ ωιλλ νοτ μακε παψμεντ φορ ρεπαιρ ωορκ ορ χλεα νινγ οφ βαρριχαδεσ. Τηε Ενγινεερ σηαλλ δεχιδε τηε συιταβλε χονδιτ ιον οφ εαχη βαρριχαδε ανδ ωηεν εαχη βαρριχαδε νεεδσ ρεπαιρινγ ορ χ

λεανινγ.

(C)

Traffic Delineators. Ινσταλλ τραφφιχ δελινεατορσ το σηοω τηε τε μποραρψ αλιγνμεντ οφ δετουρ ροαδσ αχχορδινγ το τηε χοντραχτ ορ ασ σπεχι φιεδ βψ τηε Ενγινεερ.

Υπον ρεθυεστ οφ τηε Ενγινεερ, συβμιτ το τηε Ενγινεερ αν ΦΗΩΑ αππρ οωαλ λεττερ χερτιφψινγ τηατ τηε δεωιχε ισ ΝΧΗΡΠ Ρεπορτ 350 χομπλιαντ.

Μαινταιν τηε τραφφιχ δελινεατορσ ανδ κεεπ τηε τραφφιχ δελινεατορσ χλεαν ανδ ιν γοοδ ρεπαιρ. Ρεπλαχε λοστ, στολεν ορ δαμαγεδ τραφφιχ δελιν εατορσ ιμμεδιατελψ.

Ατ τηε ενδ οφ α δετουρ πηασε, ρελοχατε τηε τραφφιχ δελινεατορσ ανδ κεεπ τηε τραφφιχ δελινεατορσ χλεαν ανδ ιν γοοδ χονδιτιον το τηε νεξτ δετουρ πηασε. Ατ τηε ενδ οφ τηε χονστρυχτιον περιοδ, λεαωε ιν πλαχε ορ ρεμοωε τη ε τραφφιχ δελινεατορσ αχχορδινγ το τηε χοντραχτ ορ ασ σπεχιφιεδ βψ τηε Ενγ ινεερ. Τηε τραφφιχ δελινεατορσ ωιλλ βεχομε τηε προπερτψ οφ τηε Χοντραχτ ορ ωηεν νο λονγερ ρεθυιρεδ ον τηε προφεχτ.

(D)

Cones. Ινσταλλ τραφφιχ χονεσ αχχορδινγ το τηε χοντραχτ ορ ασ σπε χιφιεδ βψ τηε Ενγινεερ.

Υπον ρεθυεστ οφ τηε Ενγινεερ, συβμιτ το τηε Ενγινεερ αν ΦΗΩΑ αππρ οωαλ λεττερ χερτιφψινγ τηατ τηε χονεσ αρε ΝΧΗΡΠ Ρεπορτ 350 χομπλιαντ.

Μαινταιν τηε τραφφιχ χονεσ ανδ κεεπ τηε τραφφιχ χονεσ χλεαν ανδ ιν γοοδ ρεπαιρ. Ρεπλαχε λοστ, στολεν ορ δαμαγεδ τραφφιχ χονεσ ασ νεεδεδ.

(IV) Amend **645.04 Method of Measurement** to read as follows:

"**645.04 Method of Measurement.** The Engineer will not measure Additional Police Officers And/Or Additional Traffic Control Devices such as hiring the services of additional Police Officers that the Engineer requested; furnishing, installing, maintaining and removing the additional devices; and inserting the legal notices required by the Engineer on a lump sum basis according to the contract and as specified by the Engineer.

The Engineer will not measure traffic control, barricade or barricade with lamp, traffic delineator, and construction and maintenance of detours for payment."

(V) Amend **645.05 Basis of Payment** to read as follows:

The Contractor shall submit a paid invoice for the legal notice. The Engineer will make payment under the various contract items.

The Engineer will not pay for Traffic Control separately. The Engineer will consider the cost for Traffic Control as included in the contract price of the various contract items. The cost is for hiring the services of the flaggers and/or police officers; furnishing, installing, maintaining and removing all traffic controls shown in the traffic control plans; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for Barricade or Barricade With Lamp separately. The Engineer will consider the cost for Barricade or Barricade With Lamp as included in the contract price of the various contract items. The cost is for furnishing, delivering, installing, maintaining, relocating, and removing the barricade and furnishing and installing sand bags and other accepted weights; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for delineators separately. The Engineer will consider the cost for delineators as included in the contract price of the various contract items. The cost is for furnishing; installing; cleaning; maintaining correct placement; removing when required; and furnishing and installing sand bags or other accepted weights; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work.

The Engineer will not pay for construction and maintenance of detours separately. The Engineer will consider the cost for construction and maintenance of detours as included in the contract price of the various contract items. The cost is for replacing installed traffic delineators that are lost, stolen, or damaged and not due to the Contractor's negligence; relocating of traffic delineators to the next detour phase; and furnishing labor, materials, tools, equipment, and incidentals necessary to complete the work."

(VI) Replace Figures 1 through 6 dated 5/01/93 with the attached Figures 1 and 2 dated r2/97 and Figures 3 through 7 dated r10/96.

END OF SECTION

Make the following Section a part of the Standard Specifications:

"SECTION 647 - PORTABLE CONCRETE BARRIERS

647.01 Description. This section is for furnishing, installing, maintaining, relocating, and subsequently removing portable concrete barriers according to the contract.

647.02 Materials. Materials shall conform to the following:

Reinforcing Steel	709.01
Reflector Marker	712.21
Preformed Pavement Marking Tape	712.53
Structural Steel	713.01
Bolts and Nuts	713.03

647.03 Construction Requirements.

(A) Fabrication. Construct the portable concrete barriers according to Standard Plan TE - 64 and as modified herein. The barriers shall be in 20 - foot segments. Prior to fabrication of the portable concrete barrier, submit detailed shop drawings to the Engineer for acceptance.

(1) Forms. Forms shall be according to Section 503 - Concrete Structures.

(2) Placing Concrete. Moisten the form thoroughly immediately prior to the placing of the concrete. Place the concrete according to Section 503 - Concrete Structures.

(3) Curing. Steam or water-cure the portable concrete barriers according to Subsection 504.03(G) - Curing.

(4) Handling. Do not handle the portable concrete barriers until the concrete has attained a compressive strength of more than 3,000 pounds per square inch. Use the lifting holes to hoist the portable concrete barrier. Repair or replace units damaged by improper handling at no cost to the State.

The Engineer will permit stacking of precast units with prior

acceptance by the Engineer of the method to be employed by the Contractor.

(5) Accessories. Furnish and install one RM-2 reflector marker on top of the concrete barrier (not RM-3 as shown on the Standard Plan) and a longitudinal 4-inch by 20 feet permanent preformed pavement marking tape, Type I (color to match appropriate roadway pavement stripe) on the side of the barrier facing traffic on each section.

(6) Ownership. Upon completion of the project, the portable concrete barriers shall become the property of the State.

(B) Installation. Erect all units as shown on the plans or as specified by the Engineer. Set the units in a vertical position, closely following the roadway grade. The units shall have a maximum of 1/4-inch offset in any direction between adjacent panels at the connections. Horizontal alignment of the panels shall be such that any panel is not out of alignment by more than 1/2-inch from straight line. Furnish and install steel pins for connecting the barrier sections.

Remove, clean, repair, and store all units as specified by the Engineer upon completion of the work.

647.04 Method of Measurement. The Engineer will not measure portable concrete barriers.

647.05 Basis of Payment. The Engineer will pay for the accepted portable concrete barriers at the lump sum price in option B. The price includes full compensation for furnishing, installing, maintaining, relocating and removing the portable concrete barriers, including reflector markers, permanent preformed pavement marking tape, reinforcing steel, nuts and bolts; and furnishing labors, materials, tools, equipment, and incidentals necessary to complete the work.

Make the following section a part of the Standard Specifications:

SECTION 649 - INERTIAL BARRIER SYSTEMS

649.01 Description. This section is for furnishing and installing Inertial Barrier Systems according to the contract or as specified by the Engineer.

649.02 Materials. The Inertial Barrier System shall consist of the following:

(A) Modules. The modules shall consist of containers in 200, 400, 700, 1400, and 2100-pound sizes. The 200, 400, 700 and 1400-pound modules shall consist of a container with a minimum capacity of 14 cubic feet. The 2100-pound modules shall consist of a container with a minimum capacity of 21 cubic feet.

(B) Containers. The material shall be durable, weatherproof, and shall resist deterioration from ultraviolet rays. The color shall be yellow. The Container shall be of continuous molded construction and be nestable. The containers shall be a frangible polyethylene material which shatter upon impact to permit dispersion of the sand mass contained within.

(1) Lid. Each container shall have a black lid which locks securely over the top lip of the outer container. Material shall be durable, weatherproof, and shall be formulated to resist deterioration from ultraviolet rays.

(2) Insert. All 200, 400 and 700-pound containers will require a cone-shaped supporting insert used to support various sand masses. Cone inserts shall be of one-piece molded construction and be nestable.

(C) Sand. Sand placed into these modules shall be washed concrete sand conforming to ASTM-C-33 or equal.

Each Inertial Barrier System array shall be configured to provide a satisfactory average rate of deceleration (8 g's maximum preferred for each row) for errant vehicles in the weight ranges of 1810 to 4410 pounds. The Inertial Barrier System shall meet the requirements of NCHRP 350 for Test Level 3 for nonredirective gating crash cushions. For impact vehicles weighing between 1810 and 4410 pounds and traveling at speeds of up to 62 miles per hour, the maximum 24 inches occupant flail space velocity shall be less than 39 feet per second and the vehicles' highest 10 millisecond occupant ridedown acceleration shall be less than 20 g's.

The center of gravity of each properly-filled module shall be at a height which will control the pitch of standard passenger vehicles.

The components of the modules shall interface to prevent leakage of sand contained therein. The interface shall, however, permit drainage of excess water contained within the sand mass.

649.03 Construction Requirements. The Contractor shall submit, within 7 days of contract award, a Certificate of Compliance to the Engineer stating that the Inertial Barrier System meets the requirements of NCHRP 350, Test Level 3.

Placement of the modules within an array and the geometric design of the array shall be as shown on the plans, as indicated by the manufacture's specifications or as specified by the Engineer based on the posted speed of the roadway. In locations where the barrier system separates two roadways, the barrier array and geometric design shall be based on the higher posted speed of the two roadways.

649.04 Method of Measurement. The Engineer will not measure inertial barrier modules.

649.05 Basis of Payment. The Engineer will pay for the accepted inertial barrier modules at the lump sum price in option B. The price includes full compensation for submitting a list of materials and equipment to be incorporated in the work; grading; furnishing, installing, and compacting aggregate subbase; furnishing, assembling, and installing an Inertial Barrier System; filling each installed inertial barrier module with sand; and furnishing labor, materials, tools, equipment and incidentals necessary to complete the work.

END OF SECTION

Make the following Section a part of the Standard Specifications:

"SECTION 672 - RESET PORTABLE CONCRETE GUARDRAIL SECTIONS

672.01 Description. This work shall consist of removing, transporting, setting and resetting the intermediate and terminal portable concrete guardrail sections in the new locations as shown on Plans and as ordered by the Engineer. This work also includes transportation and final placement of the portable concrete guardrail sections to Maui District Base Yard.

672.02 Construction Requirements.

(A) The units shall be removed from the stockpile at the casting yard or from the project site or from the Maui District Baseyard, transported and set at the location shown on the Plans or as ordered by the Engineer.

(B) All units shall be erected as noted on the Plans or as ordered by the Engineer. The units shall have a maximum of 1/4 inch offset in any direction between adjacent panels at the connections. Horizontal alignment of the panels shall be such that any panel is not out of alignment by more than 1/2-inch from straight line.

(C) The units shall be set in a vertical position, closely following the roadway grade. All installations shall be done in a first class workman-like manner.

(D) All units shall be removed, cleaned, repaired and stored as ordered by the Engineer upon completion of the work.

(E) The Contractor shall furnish and install one (1) RM-2 reflector marker on each section (not RM-3 as shown on the Standard Plan) and a longitudinal 4-inch wide, 20 feet long permanent preformed pavement marking tape, Type 1 (color to match appropriate pavement stripe) on the side of the guardrail facing traffic on each section. The Contractor shall furnish and install steel pins for connecting the guardrail sections.

672.03 Method of Measurement. The Engineer will not measure resetting portable concrete guardrail sections. Each section of the intermediate and terminal portable concrete guardrail panel shall be considered as a unit.

672.04 Basis of Payment. The Engineer will pay for the accepted resetting portable concrete guardrail sections at the lump sum price in option B, as installed as shown on the plans. Resetting concrete guardrail to facilitate the Contractor's work shall not be paid for separately and shall be considered incidental to the various contract items. Payment for resetting the sections shall be full compensation for furnishing all labor, materials, tools, equipment and incidentals necessary for removing sections from the casting yard, from locations on-site or

from the Maui District Baseyard, transporting them to the new locations, preparing beds, setting sections, furnishing, installing and maintaining reflector markers and permanent pavement marking tape, furnishing connection pins, connecting sections as necessary to complete a satisfactory installed unit, maintaining units, and final removal, cleaning, repairing and storing sections within the Maui District Baseyard or as ordered by the Engineer.